October 2000

Configuration and Options Guide

EMEA

IBM @server xSeries

xSeries

Netfinity

Rack products

Fibre Channel

Storage Enclosures

Clustering

Cables

Options

@server PROVEN

xSeries 200

xSeries 220

xSeries 230 /
Netfinity 5100

xSeries 240 /
Netfinity 5600

Netfinity 1000
Value Model

Netfinity 3000

Netfinity 3500
M20

Netfinity7100

Netfinity 7600

Netfinity 8500R

Netfinity 6000R

xSeries 340 /
Netfinity 4500R

Netfinity 4000R

IBM Rack Enclosure

IBM FAStT EXP200
Storage Enclosure

IBM FAStT EXP500
Storage Enclosure

xSeries 330

IBM NetBAY3

IBM EXP200
Storage Enclosure

xSeries 150

xSeries 130
xSeries 135

IBM EXP300
Storage Enclosure

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Product Positioning	❒	❒	❒
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Product Family Pages	❒	❒	❒
Sample Configurations	❒	❒	❒
Fibre Array Section	❒	❒	❒
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Positioning of Configurator Aids

There are several sources of configuration assistance available which complement one another by providing aid at different levels and with different deliverables. Any combination of the configurators should be used depending on the situation. Always verify your hardware configurations with Network Operating System compatibility by accessing the Proven compatibility pages on the World Wide Web at URL http://www.pc.ibm.com/us/compat

OrderBUILDER Configurator: - a 32-bit Windows application containing local part numbers and prices, enabling the user to configure systems for all PSG brands. Configurations can be added to a formatted Quote and then either printed directly from OrderBUILDER or exported to another application. OrderBUILDER provides coverage for 29 country versions and weekly update files are distribuuted via the Web and Lotus Notes. See Distribution and Contact information below.

Spreadsheet Configurator:- a quick, easy to use tool that incorporates local part numbers and prices in 19 country versions. Euro pricing is also included and the tool enables the user to quickly perform most System and Rack configurations with onscreen guidance provided. It is available in either Microsoft Excel or Lotus 1-2-3 formats and updated versions are distributed monthly via the Web and Lotus Notes.

Rack Configurator:- a graphical Windows application that can be used to configure solutions for the 42U and NetBAY22 Rack Units. It assists the user to decide optimum placement of items taking into account space, power and weight factors. It provides cabling recommendations and supplies detailed specification sheets, parts lists and floor plans. The Rack Configurator is distributed in one European version and is updated inline with new product announcements.

Configuration and Options Guide (this document!):- produced in Adobe Acrobat (.PDF) format that can be printed and used as hardcopy or viewed onscreen using Acrobat Reader. This configurator contains the complete range of currently marketed xSeries and Netfinity products and gives, for example, information on which options are required to achieve total amounts of memory or storage, while indicating pre-requisite items such as cables. This is a powerful, complete, yet easy to use tool that is produced in one European version. Updated versions are available monthly without pricing.

Tape Sizer - Total Cost of Ownership Tool:- this spreadsheet is intended to help evaluate the three-year total cost of ownership estimation for different tape formats, based on the following factors - drive performance, media usage, cartridge changing costs, cleaning frequency, cleaning cartridge usage. It is produced in Microsoft Excel format only, but can be loaded into Lotus 1-2-3, although formatting and use of navigation links will be affected. The pricing used for the comparison between different solutions is Estimated Selling Price (ESP).

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Configurator Distribution

All Users: Internet: http://www.pc.ibm.com/europe/configurators - OrderBUILDER Updates, latest versions of Spreadsheet Configurator, Configuration and Options Guide, Rack Configurator, Tape Sizer.

Business Partners: Lotus Notes: PC PartnerInfo:- Marketing Essentials Database - OrderBUILDER Updates, Spreadsheet Configurator, Configuration and Options Guide, Rack Configurator, Tape Sizer; Business Essentials Database - OrderBUILDER Updates, Spreadsheet Configurator.

IBM Internal: IBM EMEA xSeries / Netfinity Intranet site: w3.ibm.com/psg/emea/xseries - OrderBUILDER Application and Updates, Spreadsheet Configurator, Configuration and Options Guide, Rack Configurator, Tape Sizer.

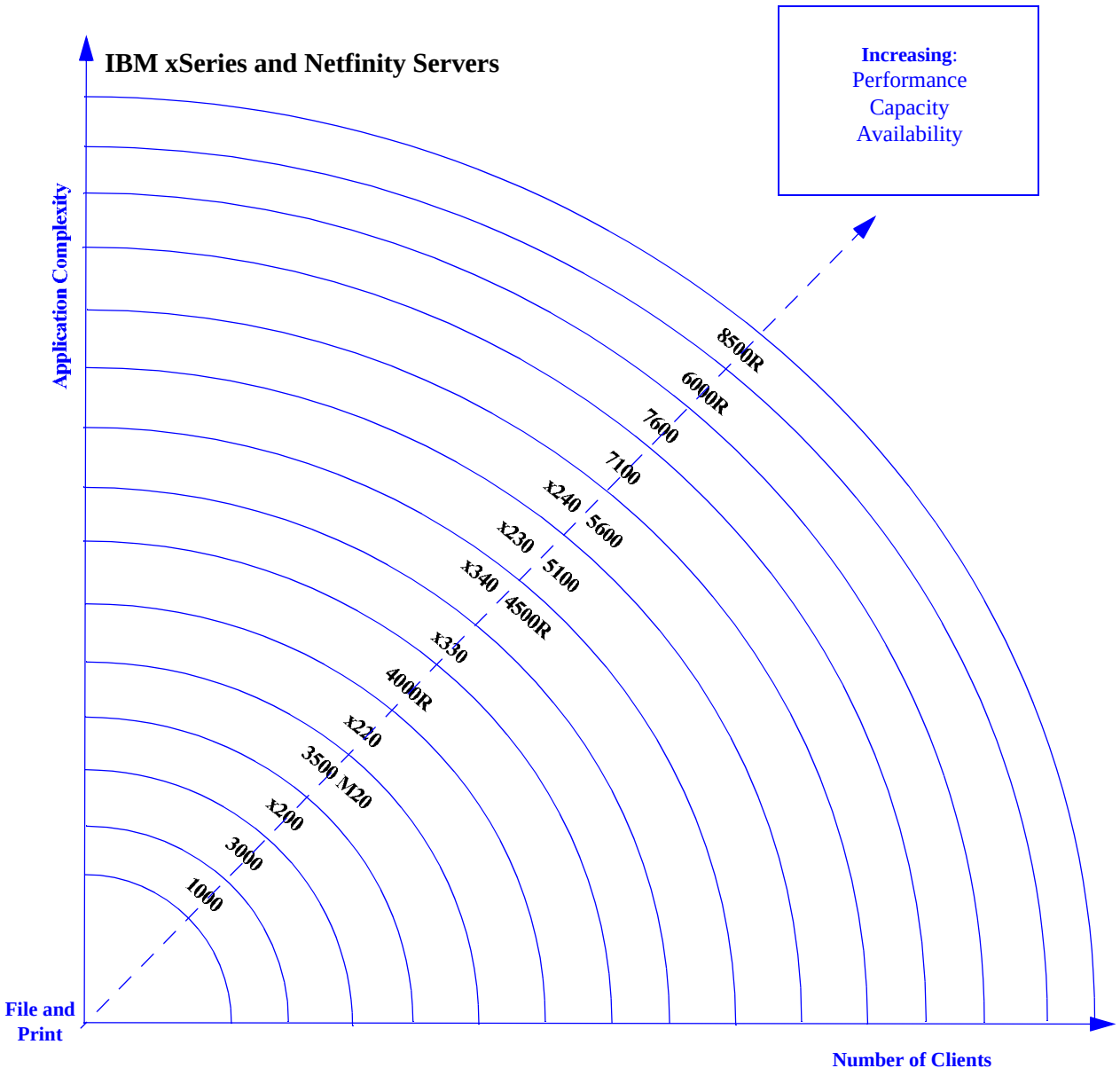
The OrderBUILDER application is available on CD - to receive your copy, send an e-mail to the address below with your name, company and full address details (not PO Box numbers)

For further information contact:-

e-mail: psg_configure@uk.ibm.com

Notes Mail: EMEA PSG-Configuration-Support/UK/IBM@IBMGB

Server Product Positioning



When in a competitive situation, this table suggests the appropriate IBM xSeries or Netfinity server to bid against other vendors' equipment. However, as an IBM business partner, you may determine that customer specific requirements may make an alternative IBM solution a better choice

	Value	Price Performance	Mission Critical	Rack Optimized
8-way			**IBM:** Netfinity 8500R **Compaq**: ProLiant 8000 **Dell**: No Offering **HP**: NetServer LH 6000, LT6000R	**IBM:** Netfinity 8500R **Compaq**:ProLiant 8500 **Dell**: PowerEdge 8450 **HP**: NetServer LXr 8000
4-way		**IBM:** Netfinity 7100 **Compaq**: ProLiant 5500, ML570 **Dell**: PowerEdge 6400 **HP**: NetServer LH4	**IBM:** Netfinity 7600 **Compaq**: No Offering **Dell**: No Offering **HP**: NetServer LXr 8000	**IBM:** Netfinity 6000R **Compaq**: ProLiant 6400, DL580 **Dell**: PowerEdge 6450 **HP**: NetServer LH4r
2-way	**IBM:** xSeries 220, Netfinity 3500 M20 **Compaq**: ProLiant ML350 **Dell**: PowerEdge 1300 **HP**: NetServer E60	**IBM:** xSeries 230**,** Netfinity 5100 **Compaq**: ProLiant ML370 **Dell**: PowerEdge 2400 **HP**: NetServer LC2000	**IBM:** xSeries 240, Netfinity 5600 **Compaq**: ProLiant ML530 **Dell**: PowerEdge 4400 **HP**: NetServer LH 3000	**IBM:** xSeries 330, 340, Netfinity 4000R, 4500R **Compaq**: ProLiant DL380, DL360 **Dell**: PowerEdge 2450 **HP**: NetServer LPr
Uni	**IBM:** xSeries 200, Netfinity 1000 **Compaq**: ML330 **Dell**: No Offering **HP**: No Offering	**IBM:** Netfinity 3000 **Compaq**: ProLiant 400 **Dell**: No Offering **HP**: No Offering		

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This chart represents general guidelines for selecting the appropriate server based on the number of users that can be supported in a particular application environment. This chart is for general guidance since each customer environment is unique and is unlikely to be precisely represented by any of the specific applications in the chart, but by using the chart, a reasonable approximation can be derived. External Storage Units are utilized when internal capacities are exceeded. Utilize the chart by following the steps outlined on the following page. These are not published benchmark results. Access http://www.ibm.com/pc/us/techlink/srvperf.html to obtain benchmark data.

Application/Expectation of Maximum # of Users		Netfinity 1000 Value Model Uni-Pentium III 700 MHz/ 256KB	Netfinity 3000 Uni-Pentium III 700 MHz/ 256 KB	xSeries 200 Uni-Pentium III 866 MHz/ 256 KB	Netfinity 3500 M20 Dual Pentium III 800 MHz/ 256 KB	xSeries 220 Dual Pentium III 933 MHz/ 256 KB	xSeries 330 Dual Pentium III 1 GHz/ 256 KB
DB Transaction Processing Select, Update and Delete; Does not include image or Decision Support	# of Users	50	1125	1280	1950	1325	2170
	# of processors	1	1	1	2	1	2
	Memory (MB)	384	768	768	1 to 2 GB	768	1 to 2 GB
	# Hard Disk Drives	3	12 to 18	12 to 18	36 to 48	12 to 18	36 to 48
	# RAID Adapters	-	≥ 1 SCSI	≥1 SCSI	≥1	≥1	≥2
	#Network Connections	1	1	1	1	1	1
File and Print Application is stored locally. (For server stored applications - cut number of users in half).	# of Users	100	1000	1000	2000	1000	2100
	# of Processors	1	1	1	2	1	2
	Memory (MB)	512	768	768	1 to 2 GB	768	1 to 2 GB
	# Hard Disk Drives	3	4 to 8	4 to 8	16 to 24	4 to 8	20 to 30
	# RAID Adapters	-	≥ 1 SCSI	≥ 1 SCSI	1 to 2	1	1 to 2
	# 100Mbps Ethernet Connections	≥ 2	≥ 2	≥ 2	4	4	4
Lotus Notes 10% Power Users 40% Mail 50% Mail & DB	# of Users	100	675	740	1800	735	2000
	# of Processors	1	1	1	2	1	2
	Memory (MB)	384	768	1 GB	2 GB	768	2GB
	# Hard Disk Drives	3	4 to 8	4 to 8	16 to 20	4 to 8	20 to 30
	# RAID Adapters	-	≥ 1 SCSI	≥ 1 SCSI	1	1	1 to 2
	# Network Connections	≥ 1	≥ 1	≥ 1	≥2	≥2	≥2
Microsoft Exchange Server 5.5 100% Med Users 30 MB Mailbox	# of Users	600	700	1980	850	2200	2310
	# of Processors	1	1	2	1	2	2
	Memory (MB)	256	384	1 GB	512	1 GB	2 GB
	# Hard Disk Drives	3	3 to 4	9	3 to 4	10	10
	# RAID Adapters	-	≥ 1 SCSI	1	≥ 1 SCSI	≥ 1 SCSI	1
	# Network Connections	≥ 1	≥ 1	≥1	≥1	≥1	≥2
SAP 3-Tier Distributed Ver 4.0b Processing Sales and Distribution Application (Minimum of 16-20 Servers) See Note 1.	# of Users	-	-	-	-	-	-
	# of Processors	-	-	-	-	-	-
	Memory (MB)	-	-	-	-	-	-
	# Hard Disk Drives	N/A	N/A	N/A	N/A	N/A	N/A
	# RAID Adapters	-	-	-	-	-	-
	# Network Connections	-	-	-	-	-	-
SAP Central Ver 4.0b Processing Sales and Distribution Application (One Server) See Note 1.	# Users	-	-	75	139	80	160
	# Processors	-	-	1	2	1	2
	Memory (MB)	-	-	1 GB	1 GB	1 GB	1 GB
	# Hard Disk Drives	N/A	N/A	12	12 to 24	12	12 to 24
	# RAID Adapters	-	-	≥1	≥1	≥1	≥1
	# Network Connections	-	-	1	1	1	1
High Availability Features	Hot-Swap HDD Bays	-	-	-	-	-	-
	Hot-Plug PCI Slots	-	-	-	-	-	-
	Hot-Swap Power	-	-	-	-	-	-
	Hot-Swap Fans	-	-	-	-	-	-
	RAID	-	Opt.	Opt.	Opt.	Opt.	Opt.
	Clustering Support	-	-	-	-	-	-
	Sys. Mgt. Processor	-	Opt.	-	Opt.	Opt.	-
Other Distinquishing Features	Max # Processors	1	1	2	1	1	2
	Max Memory (MB)	768	768	2 GB	768	768	2 GB
	Max Int. Storage (GB)	30.3	145.6	145.6	145.6	145.6	72.8
	Max Int. Storage (GB) with Int. Tape drive	30.3	109.2	145.6	109.2	109.2	N/A
	Available PCI Slots	3	2	5	5	5	2
	19" Rack Models	-	-	-	-	-	-
	NetBAY3x Support	-	-	-	-	-	-

1. This information for SAP is a guide only. Refer to the IBM SAP R/3 Advanced Sizing and Planning Questionnaires at: www.pc.ibm.com/europe/configurators , or to your IBM representative, for more information.

Application/Expectation of Maximum # of Users		xSeries 340 / Netfinity 4500R Dual Pentium III 1 GHz/ 256 KB	xSeries 230 Netfinity 5100 Dual Pentium III 1 GHz/ 256 KB	xSeries 240 Netfinity 5600 Dual Pentium III 1 GHz/ 256 KB	Netfinity 6000R Quad Pentium III Xeon 700 MHz/ 2048 KB	Netfinity7100 Quad Pentium III Xeon 700 MHz/ 2048 KB	Netfinity7600 Quad Pentium III Xeon 700 MHz/ 2048 KB	Netfinity 8500R Eight-Way Pentium III Xeon 700 MHz/ 2048 KB
DB Transaction Processing Select, Update and Delete; Does not include image or Decision Support	# of Users	2720	2720	3650	6420	6420	6420	10,315
	# of processors	2	2	2	4	4	4	8
	Memory (MB)	2 to 3 GB	2 to 3 GB	4 GB	4 GB	4 GB	4 GB	4 GB
	# Hard Disk Drives	48 to 64	48 to 64	80 to 140	80 to 140	80 to 140	80 to 140	180 to 250
	# RAID Adapters	≥2	≥2	≥3	≥4	≥5	≥5	≥5 or Fibre
	#Network Connections	1	1	2 to 3	2 to 3	2 to 3	2 to 3	2 to 3
File and Print Application is stored locally. (For server stored applications - cut number of users in half).	# of Users	2100	2100	2100	5000	5000	5000	6000
	# of Processors	2	2	2	2	2	2	3-4
	Memory (MB)	1 to 2 GB	1 to 2 GB	1 to 2 GB	2 to 4 GB	2 to 4 GB	2 to 4 GB	4 GB
	# Hard Disk Drives	20 to 30	20 to 30	20 to 30	50 to 90	50 to 90	50 to 90	75 to 150
	# RAID Adapters	1 to 2	1 to 2	1 to 2	4	≥4	≥4	≥4 or Fibre
	# 100Mbps Ethernet Conn.	4	4	4	8	8	8	10
Lotus Notes 10% Power Users 40% Mail 50% Mail & DB	# of Users	2110	2110	2110	4215	4215	4215	6695
	# of Processors	2	2	2	4	4	4	8
	Memory (MB)	2 to 3 GB	2 to 3 GB	2 to 3 GB	3 GB	3 GB	3 GB	4 GB
	# Hard Disk Drives	20 to 30	20 to 30	20 to 30	20 to 30	20 to 30	20 to 30	30 to 40
	# RAID Adapters	1 to 2	1 to 2	1 to 2	2 to 3	2 to 3	2 to 3	≥3
	# Network Connections	≥2	≥2	≥2	≥3	≥3	≥3	≥4
Microsoft Echange Server 5.5 100% Med Users 30 MB Mailbox	# of Users	2310	2310	2310	6400	6600	7000	8000
	# of Processors	2	2	2	4	4	4	8
	Memory (MB)	2 GB	2 GB	2 GB	3 GB	≥3 GB	4 GB	4 GB
	# Hard Disk Drives	9	12	12	30	30 to 40	40 to 50	40 to 50
	# RAID Adapters	1	1	2	2	≥2	≥3	≥3
	# Network Connections	≥1	≥1	≥1	≥2	≥2	≥2	≥2
SAP 3-Tier Distributed Ver 4.0b Processing Sales and Distribution Application (Minimum of 16-20 Servers) See Note 1.	# of Users	-	2790	2800	4300	3150	3350	5100
	# of Processors	-	2	2	4	4	4	8
	Memory (MB)	-	1 to 2 GB	1 to 2 GB	≥4 GB	≥4 GB	≥4 GB	≥4 GB
	# Hard Disk Drives	N/A	24 to 36	24 to 36	48 to 60	48 to 60	48 to 60	48 to 60
	# RAID Adapters	-	≥2	≥2	≥3	≥3	≥3	≥3
	# Network Connections	-	1	1	1	1	1	1
SAP Central Ver 4.0b Processing Sales and Distribution Application (One Server) See Note 1.	# Users	160	162	180	312	245	245	375
	# Processors	2	2	2	4	4	4	8
	Memory (MB)	1 GB	1 to 2 GB	1 to 2 GB	≥2 GB	≥2 GB	≥2 GB	≥4 GB
	# Hard Disk Drives	12 to 24	12 to 24	12 to 24	24 to 36	24 to 36	24 to 36	24 to 36
	# RAID Adapters	≥1	≥1	≥1	≥2	≥2	≥2	≥2
	# Network Connections	1	1	1	1	1	1	1
High Availability Features	Hot-Swap HDD Bays	X	X	X	X	X	X	X
	Hot-Plug PCI Slots	-	-	X	X	Opt.	X	X
	Hot-Swap Power	X	Opt.	X	X	X	X	X
	Hot-Swap Fans	X	-	X	X	X	X	X
	RAID	Opt.	Opt.	Opt.	Opt.	Opt.	X	Opt.
	Clustering Support	X	X	X	-	X	X	X
	Sys. Mgt. Processor	X	X	X	X	X	X	X
Other Distinquishing Features	Max # Processors	2	2	2	4	4	4	8
	Max Memory (MB)	4 GB	4 GB	4 GB	16 GB	16GB	16GB	32 GB
	Max Int. Storage (GB)	218.4	218.4	218.4	218.4	364	364	72.8
	Max Int. Storage (GB) with Int. Tape drive	109.2	218.4	218.4	N/A	364	364	N/A
	Available PCI Slots	5	5	5	6	6	5	12
	19" Rack Models	X	X	X	X	X	X	X
	NetBAY3x Support	-	-	-	-	X	X	X[2]

1. This information for SAP is a guide only. Refer to the IBM SAP R/3 Advanced Sizing and Planning Questionnaires at: www.pc.ibm.com/europe/configurators , or to your IBM representative, for more information.
2. 8500R - with a Rack-to-Tower kit installed.

Procedure for Server Selection Guidance Chart

File and Print numbers are Novell Netware-based with all others based on Microsoft Windows NT. Other Networking Operating System (NOS) results could vary.
Extensive SAP sizings are available from IBM/SAP Competency Centres. Contact your IBM Marketing Representative for additional information.
Step 1: Determine which application (row) most closely represents the customer's environment.
Step 2: Move from left to right along the row (chosen in Step 1) noting which columns contain numbers that are equal to or greater than the maximum customer's planned number of users.
Step 3: Move up the columns (chosen in Step 2) to the top row to determine which IBM xSeries or Netfinity Servers should be considered as possible solutions.
Step 4: Evaluate other features such as storage, memory capacity, high availability components, number of available expansion slots, etc., which are unique to each server, in order to determine which is the most appropriate to recommend.
For your reference, configuration information corresponding to the number of users is also provided.

Appliance Server and Business Model Summary

Product Family	Withdrawal Date: ddmmyy[13]	Part Number	Processor Speed (MHz)	Number of Processors (Std/Max)	L2 ECC Cache. (KB)	Memory: (Std/Max)(R=RDIMM)	Form Factor	Power Supply Quantity (Std/Max)	Ethernet (Mbps)(OB=Onboard)	Additional SCSI Controller (Part Number)	Internal Hard Disk Drive Std (Quan/P/N)	Bays (Total/Avail)	Slots (Total/Avail)	Std. Model P/N*
APPLIANCE SERVERS														
xSeries 130	-	K41YXxx	800[3]	1/2	256	256MB[R]/1GB[1,4]	Rack(1U)	1/1	2 x 10/100[OB]	-	1 x 37L7204	4/1	2/1[14]	NOTE: 15
xSeries 135	-	K41XXxx	800[3]	1/2	256	256MB[R]/1GB[1,4]	Rack(1U)	1/1	2 x 10/100[OB]	-	1 x 37L7204	4/1	2/0[14]	NOTE: 16
xSeries 150	-	K833Yxx	800[3]	1/2	256	256MB[R]/2GB[4]	Tower	2/3	2 x 10/100[17]	37L6091	3 x 37L7206[19]	10/5	5/3	NOTE: 20
xSeries 150	-	K83XYxx	800[3]	2/2[2]	256	1GB[R]/2GB[4]	Rack(5U)	2/3	4 x 10/100[18]	37L6889	6 x 37L7206[19]	10/2	5/1	NOTE: 21
BUSINESS MODELS														
xSeries 330	-	K412Gxx	800[3]	1/2	256	512MB[R]/4GB[4,10]	Rack(1U)	1/1	2 x 10/100[OB]	37L6091	2 x 37L7205	4/0	2/1	K411Yxx
xSeries 330	-	K432Gxx	866[3]	1/2	256	512MB[R]/4GB[4,10]	Rack(1U)	1/1	2 x 10/100[OB]	37L6091	2 x 37L7205	4/0	2/1	K431Yxx
xSeries 330	-	K442Gxx	933[3]	1/2	256	512MB[R]/4GB[4,10]	Rack(1U)	1/1	2 x 10/100[OB]	37L6091	2 x 37L7205	4/0	2/1	K441Yxx
xSeries 330	-	K452Gxx	1GHz[3]	1/2	256	512MB[R]/4GB[4,10]	Rack(1U)	1/1	2 x 10/100[OB]	37L6091	2 x 37L7205	4/0	2/1	K451Yxx
xSeries 340	-	K66SGxx	1GHz[3]	1/2	256	256MB[R]/4GB[4,8]	Rack(3U)	1/2	10/100[OB]	37L6091	3 x 37L7205	8[9]/3	5/4	K66RYxx
xSeries 230	-	K862Gxx	1GHz[3]	1/2	256	256MB[R]/4GB[4,8]	Tower	1/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	K861Yxx
xSeries 240	-	K481Gxx	1GHz[3]	1/2	256	512MB[R]/4GB[4,6]	Tower	2/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	K481Yxx
4500R	-	614G9xx	733[3]	1/2	256	256MB[R]/4GB[4,8]	Rack(3U)	1/2	10/100[OB]	37L6091	3 x 37L7205	8[9]/3	5/4	61RYMxx
4500R	-	634G9xx	800[3]	1/2	256	256MB[R]/4GB[4,8]	Rack(3U)	1/2	10/100[OB]	37L6091	3 x 37L7205	8[9]/3	5/4	63RYTxx
4500R	-	644G9xx	866[3]	1/2	256	256MB[R]/4GB[4,8]	Rack(3U)	1/2	10/100[OB]	37L6091	3 x 37L7205	8[9]/3	5/4	64RYTxx
4500R	-	654G9xx	933[3]	1/2	256	256MB[R]/4GB[4,8]	Rack(3U)	1/2	10/100[OB]	37L6091	3 x 37L7205	8[9]/3	5/4	65RYTxx
5100	-	824G9xx	733[3]	1/2	256	256MB[R]/4GB[4,8]	Tower	1/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	821YExx
5100	-	834G9xx	800[3]	1/2	256	256MB[R]/4GB[4,8]	Tower	1/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	831YExx
5100	-	844G9xx	866[3]	1/2	256	256MB[R]/4GB[4,8]	Tower	1/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	841YExx
5100	-	854G9xx	933[3]	1/2	256	256MB[R]/4GB[4,8]	Tower	1/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	851YExx
5600	-	454G9xx	800[3]	1/2	256	512MB[R]/4GB[4,6]	Tower	2/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	451YExx
5600	-	464G9xx	866[3]	1/2	256	512MB[R]/4GB[4,6]	Tower	2/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	461YExx
5600	-	474G9xx	933[3]	1/2	256	512MB[R]/4GB[4,6]	Tower	2/3	10/100[OB]	37L6091	3 x 37L7205	10/5	5/4	471YExx
6000R	-	23GG9xx	700[5]	2/4[2]	1024	512MB[R/]16GB[11]	Rack(4U)	1/3	10/100[OB]	37L6091	3 x 37L7205	8[12]/3	6/5	21RYMxx
6000R	-	24GG9xx	700[5]	2/4[2]	2048	512MB[R/]16GB[11]	Rack(4U)	1/3	10/100[OB]	37L6091	3 x 37L7205	8[12]/3	6/5	22RYMxx
7100	24/10/00	65TG9xx	550[5]	2/4[2]	512	512MB[7]/16GB	Tower	2/4	10/100[OB]	37L6091	3 x 37L7205	14/9	6/5	611YExx
7100	24/10/00	66TG9xx	550[5]	2/4[2]	1024	512MB[7]/16GB	Tower	2/4	10/100[OB]	37L6091	3 x 37L7205	14/9	6/5	621YExx
7100	-	67TG9xx	700[5]	2/4[2]	1024	512MB[7]/16GB	Tower	2/4	10/100[OB]	37L6091	3 x 37L7205	14/9	6/5	631YMxx
7100	-	68TG9xx	700[5]	2/4[2]	2048	512MB[7]/16GB	Tower	2/4	10/100[OB]	37L6091	3 x 37L7205	14/9	6/5	641YMxx
7100	24/10/00	65GG9xx	550[5]	2/4[2]	512	512MB[7]/16GB	Rack(8U)	2/4	10/100[OB]	37L6091	3 x 37L7205	14/9	6/5	61RYExx
7100	24/10/00	66GG9xx	550[5]	2/4[2]	1024	512MB[7]/16GB	Rack(8U)	2/4	10/100[OB]	37L6091	3 x 37L7205	14/9	6/5	62RYExx
7100	-	67GG9xx	700[5]	2/4[2]	1024	512MB[7]/16GB	Rack(8U)	2/4	10/100[OB]	37L6091	3 x 37L7205	14/9	6/5	63RYMxx
7100	-	68GG9xx	700[5]	2/4[2]	2048	512MB[7]/16GB	Rack(8U)	2/4	10/100[OB]	37L6091	3 x 37L7205	14/9	6/5	64RYMxx

* Business Models are standard models shipped with additional options already installed. They provide popular starting configurations that give price&packaging advantages for easy installation. Appliance Servers are pre-configured with a pre-loaded, tuned, software stack to allow simple ‘out-of-the-box’ installation and instant enhancement of Web server capabilities.
1. These pre-configured, pre-loaded Appliance Servers support limited expansion capability.
2.One additional processor (of the same type and speed as the standard one) is supplied already installed with this Business Model.
3. Intel Pentium III processor with advanced transfer (full speed) L2 cache and 133MHz Front-side bus (FSB).
4. High-speed 133MHz SDRAM.
5. Intel Pentium III Xeon processor with advanced transfer (full speed) L2 cache.
6. One additional 256MB memory option P/N 33L3060 is supplied already installed with this Business Model.
7. The standard memory is replaced in these models with four 128MB memory options P/N 33L3113 - already installed.
8. The standard memory is replaced in this model with one 256MB RDIMM P/N 33L3125 - already installed
9. Assumes installation of optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) which converts the two available removable media bays into three slim-line (SL) hot-swap bays.
10. One additional 256MB memory option P/N 33L3144 is supplied already installed with this Business Model.
11. Advanced Chipkill ECC memory - corrects two, three or four-bit errors.
12. Assumes installation of optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) which enables hot-swap bays 4 to 6.
13. Not available from IBM after this date: Business Partner inventory may be available.
14. The xSeries 130 Appliance Server supports the addition of 1 x P/N 3430301 Gigabit Ethernet Adapter only. The xSeries 135 Appliance Server does not support the addition of any adapters. Additional options support is limited for both of these servers.
15. The xSeries 130 Web Hosting Appliance Server is pre-loaded with a tuned Windows Powered operating system and is ready to use ‘out-of-the-box’. Pre-loaded software includes: Windows Powered OS, Microsoft Internet Information Services 5.0, Netfinity Web Server Accelerator V2.0, Advanced appliance configuration utility, Netfinity Director 2.12 UM Server Extensions (agent version).
16. The xSeries 135 Web Hosting Appliance Server is pre-loaded with a tuned Turbo Linux operating system and is ready to use ‘out-of-the-box’. Pre-loaded software includes: Turbo Linux OS, IBM HTTP Server, Appliance System Management, Advanced appliance configuration utility. The xSeries 135 Appliance Server pre-loaded software stack does not support the onboard Advanced System Management Processor
17. The xSeries 150 Network Attached Storage Appliance Server P/N K833Yxx (Tower model) includes one 10/100 onboard Ethernet controller and one additional 10/100 Ethernet adapter. Additional options support is limited for this server.
18. The xSeries 150 Network Attached Storage Appliance Server P/N K83XYxx (Rack model) includes one 10/100 onboard Ethernet controller and three additional 10/100 Ethernet adapters. Additional options support is limited for this server.
19. Only the Rack model P/N K83XYxx supports external storage via the attachment of an EXP300 enclosure.
20. The xSeries 150 Network Attached Storage Appliance Server P/N K833Yxx is pre-loaded with a tuned Windows Powered operating system and is ready to use ‘out-of-the-box’. Pre-loaded software includes: Windows Powered OS, Netfinity Director 2.12 UM Server Extensions (agent version), ServeRAID Manager RAID configuration and monitoring utilities, Advanced appliance configuration utility, Columbia Data Products Open Transaction Manager. This model is designed and configured to be a Workgroup Model. It includes a ServeRAID 4L adapter and 3 x 36.4GB Ultra160 hot-swap disks.
21. The xSeries 150 Network Attached Storage Appliance Server P/N K83XYxx is pre-loaded with a tuned Windows Powered operating system and is ready to use ‘out-of-the-box’. Pre-loaded software includes: Windows Powered OS, Netfinity Director 2.12 UM Server Extensions (agent version), ServeRAID Manager RAID configuration and monitoring utilities, Advanced appliance configuration utility, Columbia Data Products Open Transaction Manager. This model is designed and configured to be a Departmental Model. It includes a ServeRAID 4H adapter and 6 x 36.4GB Ultra160 hot-swap disks

IBM xSeries 200

xSeries 200 At-A-Glance Chart

Part Number*	Withdrawal Date: ddmmyy	Processor Speed (MHz)	Number of Processors (Std/Max)	L2 ECC Cache. (KB)	Memory (Std/Max) (R=RDIMM)	Form Factor	Power Supply Quantity (Std/Max)	Adv. System Management Processor	Onboard Ethernet (Mbps)	Hard Disk Controller (EIDE, Ultra)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std/Max)	CD-ROM (IDE)	Bays: (Tot/Av)	Slots (Tot/Av)
K811Xxx	-	667[1]	1/1	128	64MB/1.5GB	Tower	1/1	-	10/100	IDE	4/2	15/90GB[2]	48X-20X	7/4	5/5
K812Xxx[3]	-	667[1]	1/1	128	64MB/1.5GB	Tower	1/1	-	10/100	IDE	4/1	15/90GB[2]	48X-20X	7/3[3]	5/5
K813Xxx	-	667[1]	1/1	128	128MB/1.5GB	Tower	1/1	-	10/100	U160	4/2	9.1/145.6GB[2]	48X-20X	7/4	5/4
K841Xxx	-	800[4]	1/1	256	64MB/1.5GB	Tower	1/1	-	10/100	IDE	4/2	15/90GB[2]	48X-20X	7/4	5/5
K842Xxx	-	800[4]	1/1	256	128MB/1.5GB	Tower	1/1	-	10/100	U160	4/2	9.1/145.6GB[2]	48X-20X	7/4	5/4
K851Xxx	-	866[4]	1/1	256	64MB/1.5GB	Tower	1/1	-	10/100	IDE	4/2	15/90GB[2]	48X-20X	7/4	5/5
K852Xxx	-	866[4]	1/1	256	128MB/1.5GB	Tower	1/1	-	10/100	U160	4/2	9.1/145.6GB[2]	48X-20X	7/4	5/4

* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance.
1. Intel Celeron processor.
2. Maximum capacity assumes replacement of standard hard disk drives and tape drive (if installed), with the largest supported IBM hard disk drive.
3. This model is configured with an IBM 10/20GB TR5 Internal IDE Tape Drive P/N 20L0549 as standard.
4. Intel Pentium III processor with advanced transfer (full speed) L2 cache and 133 MHz front-side bus (FSB).

xSeries 200 Processor Upgrades

Part Number	Processor Upgrades 256 KB Advanced Transfer Cache	Processor Speed Upgrade[1]
21P9539	800 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	All K81xXxx
10K3818	866 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	All K81xXxx...K84xXxx

1.Requires removal of the standard processor. A maximum of one processor may be installed. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine type "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 200 Memory Configurator

DIMM Socket
DIMM Socket
DIMM Socket

Part Number	Memory Description
33L3079	64MB 133MHz ECC SDRAM DIMM Memory
33L3081	128MB 133MHz ECC SDRAM DIMM Memory
33L3083	256MB 133MHz ECC SDRAM DIMM Memory
33L3085	512MB 133MHz ECC SDRAM Unbuffered DIMM Memory

Total System Memory[1]		DIMMs			
Standard Model with 64MB	Standard Model with 128MB	64 MB P/N 33L3079	128 MB P/N 33L3081	256 MB P/N 33L3083	512 MB P/N 33L3085
128 MB	192 MB	1			
192 MB	256 MB	2 or	1		
320 MB	384 MB	-	2 or	1	
384 MB[2]	-		3		
576 MB	640 MB			2 or	1
768 MB[2]	768 MB[2]			3	
1088 MB	1152 MB				2
1536 MB (max)[2]	1536 MB[2]				3

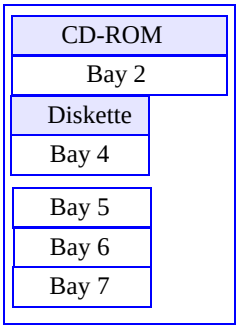
This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller DIMMs may provide a more cost-effective alternative to using larger DIMMs. Select the desired total memory from the appropriate column (Standard Model 64MB or 128MB), then select a quantity in that row from one of the DIMM columns.

1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard DIMMs.

xSeries 200 Internal Hard Disk Drive and External Storage Configurator

Total Internal Storage[1]	7200RPM Ultra160 SCSI Hard Disk Drives (HDDs)			10,000 RPM Ultra160 SCSI Hard Disk Drives (HDDs)		
	9.1 GB (P/N 00N8204)	18.2 GB (P/N 00N8205)	36.4 GB (P/N 00N8206)	9.1 GB (P/N 00N8207)	18.2 GB (P/N 00N8208)	36.4 GB (P/N 00N8209)
9.1GB	Standard on Base SCSI Models (7200 rpm)			Standard on Base SCSI Models (7200 rpm)		
18.2GB	1	-	-	1	-	-
27.3GB	2 or	1	-	2 or	1	-
36.4GB	3	-	-	3	-	-
45.5GB	-	2 or	1	-	2 or	1
54.6GB	1 and	2	-	1 and	2	-
81.9GB	-	-	2	-	-	2
91GB	1 and	-	2	1 and	-	2
100.1GB	-	1 and	2	-	1 and	2
145.6GB (max)[2]	-	-	4[2]	-	-	4[2]

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.
2. Maximum capacity assumes replacement of standard hard disk drives and tape drive (if installed) with the largest supported IBM hard disk drive.



Total Internal Storage[1]	7200RPM IDE Hard Disk Drives (HDDs)[2]		
	15 GB (P/N 19K4460)	20.4 GB (P/N 19K4461)	30 GB (P/N 00N8203)
15GB	Standard on EIDE Base Models		
30GB	1	-	-
45GB	2[3] or	-	1
55.8GB	-	2[3]	-
75GB	-	-	2[3]
90GB (max)[4]	-	-	3[4]

This table does not represent all possible hard drive configurations.

1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ±0.2 GB unless otherwise noted.
2. The xSeries 200 EIDE controllers support a maximum of four IDE devices per machine including CD-ROM drives, hard disks and IDE tape drives.
3. Not a supported configuration on model P/N K812Xxx which includes an IBM 10/20 GB TR5 Internal IDE Tape Drive P/N 20L0549 as standard.
4. Maximum capacity assumes replacement of standard hard disk drives and tape drive (if installed) with the largest supported IBM hard disk drive.

Bay	Form Factor	Height	Front Access	Usage
1	133 mm (5.25")	HH	yes	IDE CD-ROM
2	133 mm (5.25")	HH	yes	open[1, 2]
3	89 mm (3.5")	SL	yes	Diskette
4	89mm (3.5")	SL	yes	open
5...7	89mm (3.5")	SL	yes	open

1. Supports removable media devices only. Hard drives are not supported.
2. 10/20GB TR5 Internal IDE Tape Drive P/N 20L0549 is standard in model P/N K812Xxx.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty
IDE Hard Disk Drives (HDD)[1, 2]					
19K4460	15GB 7200 rpm ATA/100 (EIDE) HDD	7200	SL	4...7	3[3]
19K4461	20.4GB 7200 rpm ATA/100 (EIDE) HDD	7200	SL	4...7	3[3]
00N8203	30GB 7200 rpm ATA/100 (EIDE) HDD	7200	SL	4...7	3[3]
Ultra160 Hard Disk Drives (HDD)[2]					
00N8204	9.1GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4...7	4
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4...7	4
00N8206	36.4GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4...7	4
00N8207	9.1GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4...7	4
00N8208	18.2GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4...7	4
00N8209	36.4GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4...7	4

	External Storage Expansion Units[4]	Form Factor
00N6xxx[7]	Netfinity EXP200 Storage Expansion Unit[5]	Rack (3U)
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	-
37L0xxx[8]	Netfinity EXP200 350 W Redundant Power Supply	-
19K11xx[9]	EXP300 Storage Expansion Unit[6]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-

1.The xSeries 200 EIDE controllers support a maximum of four IDE devices per machine including CD-ROM drives, hard disks and IDE tape drives.
2. Mixing of IDE and SCSI hard disk drives is not supported.
3. Limited to 2 drives in model -12X due to installed tape drive option.
4. Not supported by the external SCSI port included in SCSI models. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
5. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply and standard country power cord. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0xxx) includes an additional standard country power cord. To convert an EXP200 to match the system's tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit P/N 37L5857 is required.
6. EXP300 includes a single 2M Ultra2 SCSI cable and dual hot-swap 500 W redundant power supplies, each with its own standard country power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit P/N 09N7296 is required.
7. Where 'xxx' represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/ English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English:- Line Cords/ Publication Country Kits are included throughout.
8. Where 'xxx' represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/ English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.
9.Where 'xx' represents a specific country code: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included throughout.

xSeries 200 Internal SCSI Cabling

EIDE Models
In xSeries 200 models using the EIDE interface for storage device attachment, a two-drop cable is used to attach the standard 15 GB EIDE HDD to one of the EIDE connectors. A second EIDE controller provides the interface for the IDE CD-ROM drive. A two-drop cable connects the IDE controller to the IDE CD-ROM. Up to two additional EIDE or IDE devices can be installed (one off of each controller).

SCSI Models
xSeries 200 models with a SCSI adapter are cabled internally with a five-drop, 16-bit wide LVD SCSI cable with a built-in multi-mode active terminator at one end of the cable. The other end of the cable is attached to the internal 68-pin connector of the standard Ultra160 SCSI adapter. SCSI devices can be connected to any of the five cable connectors. If 8-bit (narrow) devices are to be installed, a 68- to 50-pin converter (32G3925) is required for each narrow device.

Other Configuration Alternatives
In the case where a RAID controller is used to support internal drives in a xSeries 200, the standard cable is moved from the onboard controller to the RAID adapter. To connect a tape drive to the onboard or other supported SCSI controller, use the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340).

External SCSI support can be obtained by installing an optional SCSI adapter or RAID controller and using appropriate external SCSI cabling.

xSeries 200 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]
	Storage Controllers[2]			
37L6091	ServeRAID-4L Ultra160 SCSI Controller[3]	Full	32/64-bit	1...5
37L6080	ServeRAID-4M Ultra160 SCSI Controller[4]	Full	32/64-bit	1...5
19K4646	PCI Wide Ultra160 SCSI Adapter[7]	Half	32-bit	1...5
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1...5
	Networking[5]			
	Ethernet			
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...5
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1...5
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1...5
34L4601	Netfinity 10/100 Ethernet Security Adapter	Half	32/64-bit	1...5
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN	Half	32-bit	1...5
34L5001	16/4 Token-Ring PCI Management Adapter	Half	32-bit	1...5
	Communications[6]			
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[8]	Half	32-bit	1...5

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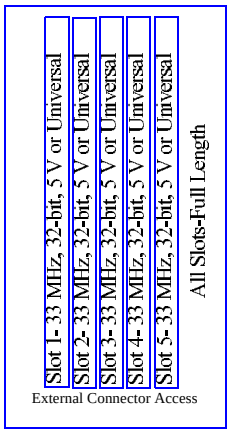

1. The xSeries 200 has five full-length, 33 MHz PCI expansion slots. The number of available slots is model specific.
2. Some models of the xSeries 200 include a single channel Ultra160 SCSI Adapter with a five drop multi-mode terminated LVD SCSI Cable. All other models include dual-channel EIDE controllers and require an optional SCSI adapter for SCSI functionality. See At-A-Glance for model attributes
3. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
4. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two external 0.8-mm VHDCI Ultra160 connectors.
5. xSeries 200 includes an integrated full-duplex, 10.100 Mbps Ethernet controller.
6. xSeries 200 includes two USB ports, two high-speed serial/asynchronous ports, (NS16550A software compatible) and one high-speed parallel port supporting devices using SSP/EPP/ECP protocols adhering to the IEEE 1284 Standard.
7. PCI Wide Ultra160 SCSI Adapter P/N 19K4646 provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
8. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (any combination of P/N 37L1414, 37L1415, 37L1416) may be installed.

xSeries 200 Power, Monitors, Accessories

Part Number	Description
	Power[1,10]
94G7448	Rack Power Cable Type C12 (3.7m)[10]
	Free Standing Uninterruptible Power Supply (UPS)[2]
SUP072Y	APC Smart-UPS 700
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
	Rack Mount Uninterruptible Power Supply (UPS)[2]
14RIxxx[9]	APC Smart-UPS 1400RMB[3,10]
30RIxxx[9]	APC Smart-UPS 3000RMB[3,10]
37L6862	APC Smart-UPS 5000RMB[4,10]
	Monitors[5]
T3347xx[8]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
31H2Nxx[8]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T32N3xx[8]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
T274Axx[8]	G78 Color Monitor 17" (406.4mm, 16.0" Viewable Image Size), stealth black[6]
11AG1xx[8]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable Image Size), stealth black[7]

1. The xSeries 200 includes a 330 W voltage sensing power supply and a single standard country power cord.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. The xSeries 200 contains a S-3 Savage-4 LT video adapter with 8Mb of video memory plugged into the standard AGP slot.
6. Installation within a rack requires optional Monitor Compartment (P/N94G7444).
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.
8. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
9. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.
10. The xSeries 200 ships with a standard country power cord. If conversion to Rack format is being carried out, Rack Power Cable P/N 94G7448 (type C12), must be ordered to allow connection to a high voltage UPS or PDU.

Part Number	Description
	Conversion Kits
09N4300	4Ux20D Tower-to-Rack Kit[6]
	Rack and NetBAY[1,6]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (Perforated Doors)
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22
36L9702	NetBAY22 Rack Extension Kit
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II
94G7448	Rack Power Cable Type C12 (3.7m)[6]
	Keyboard and Mouse[2]
28L36xx[5]	Space Saver II Keyboard[3, 4]

1 Rack installation of an xSeries 200 requires 4Ux20D Tower-to-Rack Kit (P/N 09N4300) and one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. The xSeries 200 includes both a mouse and non-space saver keyboard.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
5. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
6. The xSeries 200 ships with a standard country power cord. If conversion to Rack format and connection to a high voltage UPS or PDU is being carried out, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.

xSeries 200 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Included.	Ext. Tape Enclosures[1]
20L0549	10/20GB TR5 Internal IDE Tape Drive[2]	2, 4	-	101.6mm (3.5” SL or 133mm (5.25”) HH	-	-	-
09N4041	12/24GB DDS/3 4-mm Internal SCSI Tape Drive[3,4,5]	2	8	89 mm (3.5”) HH or 133 mm (5.25”) HH	Y	Y	10L7440, 03K8756
09N4042	10/20GB NS Internal SCSI Tape Drive[3,4,5]	2, 4	8	89 mm (3.5”) SL or 133 mm (5.25”) HH	Y	Y	10L7440, 03K8756
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[4,5]	2	16 Ultra2 LVD	89 mm (3.5”) HH or 133 mm (5.25”) HH	Y	N/A	10L7440, 03K8756[6]
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[7]	-	8/16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[8]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[9]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	External	Y	N	10L7440
10K2340	Media Bay Tray and LVD Cable Kit[4,6,10]	-	16 LVD	Internal	Y	N	-

Note: SCSI models include an Ultra160 SCSI controller with a five-drop multi-mode terminated LVD SCSI cable. Single-Ended devices attached to this cable will limit the entire SCSI bus to single-ended performance. SCSI tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which includes a five-drop multi-mode LVD SCSI cable and an external 0.8-mm VHDCI connector.

1. To determine cable requirements, note the tape drive’s SCSI interface, the appropriate SCSI controller from the system configurator section, and the desired enclosure, then refer to Appendix D: Cables - Storage Units - Controllers.
2. SCSI models include a two-drop EIDE cable for attachment to the CD-ROM and an optional IDE tape drive. EIDE Model P/N K812Xxx includes 10/20GB TR5 Internal IDE Tape Drive P/N 20L0549 as standard.
3.This single-ended device will limit the SCSI bus to which it is attached to Ultra SCSI speeds. To provide a dedicated tape SCSI bus, install PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which includes a five-drop multi-mode LVD SCSI cable.
4. For RAID configurations (in SCSI models) where the standard SCSI cable is attached to a RAID adapter, the two-drop multi-mode terminated LVD SCSI cable included with Media Bay Tray and LVD Cable Kit P/N 10K2340 is required, to allow attachment of a SCSI Tape Drive to the standard Ultra160 SCSI Adapter.
5. EIDE models require optional PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which includes a five-drop multi-mode LVD SCSI cable, to allow attachment of a SCSI Tape Drive.
6. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL P/N 03K8756 requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit P/N 10K2340 which contains a single two-drop mult-mode terminated LVD cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
7. Provides a black desktop 133 mm (5.25”) half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
8. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19” rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25”) bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
9. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in an Expansion Unit P/N 03K8756 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
10. Media Bay Tray and LVD Cable Kit P/N 10K2340 includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

xSeries 200 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server

Part Number	Description	Quantity
K812Xxx	x200 Celeron 667/128, 64MB, EIDE, 15GB, Tape, 48X	1
33L3081	128 MB 133Mhz ECC SDRAM DIMM Memory[1]	1
19K4461	20.4 GB 7200 rpm ATA/100 (EIDE) HDD[2]	1
31H2Nxx	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 192 MB of system memory.
2. For a total of 35.4 GB of internal storage.

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this is mind, the the xSeries 200 was selected to provide an affordable price point for the growing Internet server market with two-way Pentium III processing, 192 MB of system memory (expandable to 1.5 GB), and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
K852Xxx	x200 Pentium III 866/256, 128MB, Ultra160, 1 x 9.1GB, 48X	1
33L3081	128 MB 133 MHz ECC SDRAM DIMM Memory[1]	1
00N8204	9.1 GB Ultra160 SCSI HDD[2]	1
00N8205	18.2 GB Ultra160 SCSI HDD[2]	2
00N7991	20/40GB DDS/4 4-mm Internal Tape Drive	1
31H2Nxx	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 256 MB of system memory.
2. For a total of 54.6 GB of internal storage.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn't require the high-end performance and fault-tolerance properties of larger servers.

The sample configuration above consists of an xSeries 200 with 256 MB of memory and 54.6 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected during power surges and outages.

Application Server

Part Number	Description	Quantity
K852Xxx	x200 Pentium III 866/256, 128MB, Ultra160, 1 x 9.1GB, 48X	1
33L3083	256 MB 133 MHz ECC SDRAM DIMM Memory[1]	1
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
00N8204	9.1 GB Ultra160 SCSI HDD[2]	2
10K2340	Media Bay Tray and LVD Cable Kit[3]	3
09N4042	10/20 GB NS Internal SCSI Tape Drive	1
31H2Nxx	E54 Color Monitor 15" (350 mm, 13.8" Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 384 MB of system memory.
2. For a total of 27.3 GB of internal storage.
3. Cable for dedicated attachment of tape to standard controller.

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the xSeries 200 was selected to provide an affordable price point for an application server, with Pentium III processing, 384 MB of system memory (expandable to 1.5 GB), and availability features such as RAID-protected internal storage and power protection with an APC Smart-UPS.

IBM xSeries 220

Part Number*	Withdrawal Date: ddmmyy	Processor Speed (MHz)[1]	Number of Processors (Std/Max)	L2 ECC Cache. (KB)	Memory (Std/Max) (R=RD	Form Factor	Power Supply Quantity (Std/Max)	Hot-Swap Hard Disk Capability (H)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std/M	CD-ROM (IDE)[2]	Bays: (Tot/Av)	Slots (Tot/Av)
xSeries 220 At-A-Glance Chart																
K521Xxx	-	800	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
K522Xxx	-	800	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	10/100	U160	4/2	18.2/145.6GB	48X-20X	7/4	5/5
K52AXxx	-	800	1/2	256	128MB(R)/4GB	Tower	1/1	H	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
K531Xxx	-	866	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
K532Xxx	-	866	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	10/100	U160	4/2	18.2/145.6GB	48X-20X	7/4	5/5
K53AXxx	-	866	1/2	256	128MB(R)/4GB	Tower	1/1	H	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
K541Xxx	-	933	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5
K542Xxx	-	933	1/2	256	128MB(R)/4GB	Tower	1/1	-	-	10/100	U160	4/2	18.2/145.6GB	48X-20X	7/4	5/5
K54AXxx	-	933	1/2	256	128MB(R)/4GB	Tower	1/1	H	-	10/100	U160	4/2	0/145.6GB	48X-20X	7/5	5/5

* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance.
1. Intel Pentium III processor with advanced transfer (full speed) L2 cache.
2. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.

xSeries 220 Processor Upgrades

Part Number	Processor Upgrades with Advanced Transfer Cache	SMP Support[1]	Processor Speed Upgrade[2]
21P9539	800 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	All K52xXxx	-
10K3818	Netfinity 866 MHz with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Upgrade Processor	All K53xXxx	All K52xXxx
10K3819	Netfinity 933 MHz with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Upgrade Processor	All K54xXxx	All K52xXxx...K53xXxx

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
2.Requires removal of the standard processor. A maximum of one processor may be installed. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine type "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 220 Memory Configurator

DIMM Socket
DIMM Socket
DIMM Socket
DIMM Socket

Part Number	Memory Description
33L3142	128MB 133MHz SDRAM ECC RDIMM Memory
33L3144	256MB 133MHz SDRAM ECC RDIMM Memory
33L3146	512MB 133MHz SDRAM ECC RDIMM Memory
33L3152	1 GB 133MHz SDRAM ECC RDIMM

Total System Memory[1]	Quantity of RDIMMs Added			
	128 MB (1 x 128)	128 MB (33L3142)	256 MB (33L3144)	512 MB (33L3146)	1 GB (33L3152)
256MB	1	-	-	-
384 MB	2 or	1	-	-
512 MB	3	-	-	-
640 MB	-	2 or	1	-
896 MB	-	3	-	-
1024 MB	-	4[2]	-	-
1152 MB	-		2 or	1
1664 MB	-		3	-

To access IBM information specific to your country via the World Wide Web, use address: http://www.pc.ibm.com

2048 MB	-		4[2]	-
2176 MB	-		-	2
3200 MB	-		-	3
4096 MB (max)	-		-	4[2]

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller DIMMs may provide a more cost-effective alternative to using larger DIMMs. Select the desired total memory from the lefthand column (standard memory is 128MB), then select a quantity in that row from one of the DIMM columns.

1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory.

xSeries 220 Internal Hard Disk Drive and External Storage Configurator

Total Internal Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000 RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 00N8204 or 37L7201)[2]	18.2 GB (P/N 00N8205 or 37L7202)[2]	36.4 GB (P/N 00N8206 or 37L7203)[2]	9.1 GB (P/N 00N8207 or 37L7204)[2]	18.2 GB (P/N 00N8208 or 37L7205)[2]	36.4 GB (P/N 00N8209 or 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
9.1GB	1	-	-	1	-	-
18.2GB	2	1	-	2	1	-
27.3GB	3	-	-	3	-	-
36.4GB	4[3]	2	1	4[3]	2	1
45.5GB	-	-	-	-	-	-
54.6GB	-	3	-	-	3	-
72.8GB	-	4[3]	2	-	4[3]	2
91GB	-	-	-	-	-	-
109.2GB	-	-	3	-	-	3
145.6GB (max)	-	-	4[3]	-	-	4[3]

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.
2. Both hot-swap and non-hot-swap HDDs are listed. Select the appropriate part number for the model of xSeries 220 being configured.
3. A maximum of three hot-swap drives may be installed in hot-swap models. This configuration requires installation of a non-hot-swap HDD in Bay 4.

Part Number	Description	RPM	Height	Hot-Swap Models		Non-Hot-Swap Models	
				Bays Supported	Maximum Quantity	Bays Supported	Maximum Quantity
	Non-Hot-Swap Ultra160 Hard Disk Drives (HDD)[1]						
00N8204	9.1GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4	1	4...7	4
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4	1	4...7	4
00N8206	36.4GB 7200 rpm Ultra160 SCSI HDD	7200	SL	4	1	4...7	4
00N8207	9.1GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4	1	4...7	4
00N8208	18.2GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4	1	4...7	4
00N8209	36.4GB 10,000 rpm Ultra160 SCSI HDD	10,000	SL	4	1	4...7	4
	Hot-Swap Ultra160 Hard Disk Drives (HDD)[2]						
37L7201	9.1GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	5...7	3	-	-
37L7202	18.2GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	5...7	3	-	-
37L7203	36.4GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	5...7	3	-	-
37L7204	9.1GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	5...7	3	-	-
37L7205	18.2GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	5...7	3	-	-
37L7206	36.4GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	5...7	3	-	-

	External Storage Expansion Units[3]	Form Factor
00N6xxx[6]	Netfinity EXP200 Storage Expansion Unit[4]	Rack (3U)
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	-
37L0xxx[7]	Netfinity EXP200 350 W Redundant Power Supply	-
19K11xx[8]	EXP300 Storage Expansion Unit[5]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-

1.Non-hot-swap HDDs are supported in bays 4...7 of non-hot swap models and in bay 4 of hot-swap models.
2.Hot-swap HDDs are supported in bays 5...7 of hot-swap models. Bay 4 supports non-hot-swap HDDs only.
3. Not supported by the onboard SCSI controller. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
4. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply and standard country power cord. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0xxx[7]) includes an additional standard country power cord. To convert an EXP200 to match the system's tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 37L5857) is required.
5. EXP300 includes a single 2M Ultra2 SCSI cable and dual hot-swap 500 W redundant power supplies, each with its own standard country power cord. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit (P/N 09N7296) is required.
6. Where 'xxx' represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English:- Line Cords/ Publication Country Kits are included throughout.
7. Where 'xxx' represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.
8.Where 'xx' represents a specific country code: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included throughout.

Bay	Form Factor	Height	Front Access	Usage
1	133 mm (5.25")	HH	yes	IDE CD-ROM
2	133 mm (5.25")	HH	yes	open[1]
3	89 mm (3.5")	SL	yes	Diskette
4	89mm (3.5")	SL	yes	open
5...7	89mm (3.5")	SL[2]	yes	open

1. This bay does not support hard drive options. It can be used for removable media devices such as tape drives.
2. These bays will be configured as hot-swap bays on model P/Ns K52AXxx, K53AXxx, K54AXxx.

xSeries 220 Internal SCSI Cabling

Non-Hot-Swap Models
xSeries 220 non-hot-swap models are cabled internally with a five-drop, 16-bit wide LVD SCSI cable with a built-in multi-mode active terminator on one end of the cable. The other end of the cable is attached to the internal 68-pin connector of the integrated Ultra160 SCSI controller. SCSI devices can be connected to any of the five cable connectors. If 8-bit (narrow) devices are to be installed, a 68- to 50-pin converter (32G3925) is required for each narrow device.

Hot-Swap Models
xSeries 220 hot-swap models are cabled internally with a two-drop, 16-bit wide LVD SCSI cable. One end is connected to the internal 68-pin connector of the integrated Ultra160 SCSI controller. The first drop is designed to support a SCSI device in the 3.5-inch non-hot-swap bay, while the second drop is connected to the hot-swap SCSI backplane.The SCSI backplane provides termination for the SCSI bus.

Other Configuration Alternatives
In the case where a RAID controller is used to support internal drives in a xSeries 220, the standard cable is moved from the onboard controller to the RAID adapter. To connect a tape drive to the onboard or other supported SCSI controller, the two-drop cable from Media Bay Tray and LVD Cable Kit (P/N 10K2340) must be used.

External SCSI support can be obtained by installing an optional SCSI adapter or RAID controller and using appropriate external SCSI cabling.

xSeries 220 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]
	Storage Controllers[2]			
37L6091	ServeRAID-4L Ultra160 SCSI Controller[3]	Full	32/64-bit	1...5
37L6080	ServeRAID-4M Ultra160 SCSI Controller[4]	Full	32/64-bit	1...5
19K4646	PCI Wide Ultra160 SCSI Adapter[5]	Half	32-bit	1...5
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1...5
	Networking[6]			
	Ethernet			
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...5
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1...5
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1...5
34L4601	Netfinity 10/100 Ethernet Security Adapter	Half	32/64-bit	1...5
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN	Half	32-bit	1...5[7]
34L5001	16/4 Token-Ring PCI Management Adapter	Half	32-bit	1...5[7]
	Communications[8]			
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[9]	Half	32-bit	1...5

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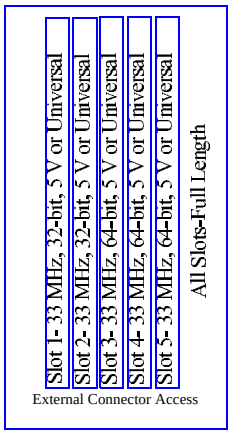


1. The xSeries 220 has five full-length, 33 MHz PCI expansion slots, three 64-bit and two 32-bit.
2. xSeries 220 has an integrated Ultra160 SCSI Controller with a single internal channel and includes a five drop, multi-mode terminated LVD SCSI cable.
3. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
4. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two external 0.8-mm VHDCI Ultra160 connectors.
5. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilized.
6. The xSeries 220 includes an integrated full-duplex, 10/100 Mbps Ethernet controller.
7. Wake on LAN function supported when installed in slot 1 only.
8. xSeries 220 includes two USB ports, two high-speed serial/asynchronous ports, (NS16550A software compatible) and one high-speed parallel port supporting devices using SSP/EPP/ECP protocols adhering to the IEEE 1284 Standard.
9. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (any combination of P/N 37L1414, 37L1415, 37L1416) may be installed.

xSeries 220 Power, Monitors, Accessories

Part Number	Description
	Power[1,10]
94G7448	Rack Power Cable Type C12 (3.7m)[10]
	Free Standing Uninterruptible Power Supply (UPS)[2]
SUP072Y	APC Smart-UPS 700
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
	Rack Mount Uninterruptible Power Supply (UPS)[2]
14RIxxx[9]	APC Smart-UPS 1400RMB[3,10]
30RIxxx[9]	APC Smart-UPS 3000RMB[3,10]
37L6862	APC Smart-UPS 5000RMB,[4,10]
	Monitors[5]
T3347xx[8]	E51 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[6]
31H2Nxx[8]	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[6]
T32N3xx[8]	E74 Color Monitor 17” (403-mm, 15.9” Viewable Image Size), stealth black[6]
T274Axx[8]	G78 Color Monitor 17” (406.4mm, 16.0” Viewable Image Size), stealth black[6]
11AG1xx[8]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0” Viewable Image Size), stealth black[7]

1. The xSeries 220 includes a 330 W voltage sensing power supply and a single standard country power cord..
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See “Rack and NetBAY” for supported IBM racks.
4. Height is 5U. See “Rack and NetBAY” for supported IBM racks.
5. The xSeries 220 includes an integrated SVGA controller(S3 Savage4 Chipset) with 8Mb of video memory
6. Installation within a rack requires optional Monitor Compartment (P/N94G7444).
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II (P/N 37L6888) and Netfinity Rack Keyboard Tray (P/N 28L4707). A space saver keyboard may coexist within the same 28L4707 keyboard tray.
8. Where ‘xx’ represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
9. Where ‘xxx’ represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.
10. The xSeries 220 ships with a standard country power cord. If conversion to Rack format is being carried out, Rack Power Cable P/N 94G7448 (type C12), must be ordered to allow connection to a high voltage UPS or PDU.

Part Number	Description
	Conversion Kits
09N4300	4Ux20D Tower-to-Rack Kit[6]
	Rack and NetBAY[1,6]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (Perforated Doors)
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22
36L9702	NetBAY22 Rack Extension Kit
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II
94G7448	Rack Power Cable Type C12 (3.7m)[6]
	Keyboard and Mouse[2]
28L36xx[5]	Space Saver II Keyboard[3, 4]

1 Rack installation of an xSeries 220 requires 4Ux20D Tower-to-Rack Kit (P/N 09N4300) and one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. The xSeries 220 includes both a mouse and non-space saver keyboard.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
5. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
6. The xSeries 220 ships with a standard country power cord. If conversion to Rack format and connection to a high voltage UPS or PDU is being carried out, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.

xSeries 220 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures[1]
09N4041	12/24GB DDS/3 4-mm Internal SCSI Tape Drive[2, 3]	2	8	89 mm (3.5") HH or 133 mm (5.25") HH	Y	Y	10L7440, 03K8756
09N4042	10/20GB NS Internal SCSI Tape Drive[2, 3]	2, 4	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	10L7440, 03K8756
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[3]	2	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	10L7440, 03K8756[4]
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[5]	-	8/16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[6]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[7]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	External	Y	N	10L7440
10K2340	Media Bay Tray and LVD Cable Kit[3,4,8]	-	16 LVD	Internal	Y	N	-

Note: All models include an Ultra160 SCSI controller with a five-drop multi-mode terminated LVD SCSI cable. Single-Ended devices attached to this cable will limit the entire SCSI bus to single-ended performance. All tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode terminated LVD SCSI cable and an external 0.8-mm VHDCI connector.

1. To determine cable requirements, note the tape drive's SCSI interface, the appropriate SCSI controller from the system configurator section, and the desired enclosure, then refer to Appendix D: Cables - Storage Units - Controllers.
2.This single-ended device will limit the SCSI bus to which it is attached to Ultra SCSI speeds. To provide a dedicated tape SCSI bus, install PCI Wide ultra160 SCSI Adapter (P/N 19K4646) which includes a five-drop multi-mode LVD SCSI cable.
3. For RAID configurations where the standard SCSI cable is attached to a RAID adapter, the two-drop multi-mode terminated LVD SCSI cable included with Media Bay Tray and LVD Cable Kit P/N 10K2340 is required, to allow attachment of a SCSI Tape Drive to the standard Ultra160 SCSI controller.
4. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 03K8756) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop mult-mode terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
5. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
6. NetMEDIA Storage Expansion Unit EL (P/N 03K8756) is a black 3U, 19" rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
7. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in an Expansion Unit P/N 03K8756 to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
8. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

xSeries 220 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server

Part Number	Description	Quantity
K53AXxx	x220 866 Mhz/256KB, 128MB ECC, OPEN-HS, 48X, PCI	1
33L3142	128 MB 133Mhz SDRAM ECC RDIMM[1]	1
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD[2]	2
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 256 MB of system memory.
2. For a total of 36.4 GB of internal storage.

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this is mind, the xSeries 200 was selected to provide an affordable price point for the growing Internet server market with two-way Pentium III processing, 256 MB of system memory (expandable to 4 GB), and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
K52AXxx	x220 800 Mhz/256KB, 128MB ECC, OPEN-HS, 48X, PCI	1
33L3142	128 MB 133Mhz SDRAM ECC RDIMM[1]	1
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD[2]	3
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 256 MB of system memory.
2. For a total of 54.6 GB of internal storage.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn’t require the high-end performance and fault-tolerance properties of larger servers.

The sample configuration above consists of an xSeries 220 with 256 MB of memory and 54.6 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected during power surges and outages.

Application Server

Part Number	Description	Quantity
K542Xxx	x220 933 MHz/256KB, 128MB ECC, 18.2GB, 48X, PCI	1
10K3819	Netfinity 933 MHz with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Upgrade Processor	1
33L3144	256 MB 133 MHz SDRAM ECC RDIMM[1]	1
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD[2]	2
10K2340	Media Bay Tray and LVD Cable Kit[3]	1
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive NS Internal SCSI Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 384 MB of system memory.
2. For a total of 54.6 GB of internal storage.
3. Contains a cable for dedicated attachment of tape to standard controller.

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the xSeries 220 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 384 MB of system memory (expandable to 4 GB), and availability features such as RAID protected internal storage and power protection with an APC Smart-UPS.

IBM xSeries 230 and Netfinity 5100

Part Number*	Withdrawal Date: ddmmyy[6]	Processor Speed (MHz)[5]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)[2]	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power[3], Slots, HDD, Fans)	Redundancy (Optional, Standard)[3]	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[4]	Bays: (Tot/Av)	Slots: (Tot/Av)
xSeries 230 / Netfinity 5100 At-A-Glance Chart																	
xSeries 230																	
K861Yxx	-	1 GHz	1/2	256	128MB (R)/4GB	Tower	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
K86RYxx[1]	-	1 GHz	1/2	256	128MB (R)/4GB	Rack(5U)	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
Netfinity 5100																	
811YExx	24/10/00	667	1/2	256	128MB (R)/4GB	Tower	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
81RYExx[1]	24/10/00	667	1/2	256	128MB (R)/4GB	Rack (5U)	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
821YExx	-	733	1/2	256	128MB (R)/4GB	Tower	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
82RYExx[1]	-	733	1/2	256	128MB (R)/4GB	Rack (5U)	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
831YExx	-	800	1/2	256	128MB (R)/4GB	Tower	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
83RYExx[1]	-	800	1/2	256	128MB (R)/4GB	Rack (5U)	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
841YExx	-	866	1/2	256	128MB (R)/4GB	Tower	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
84RYExx[1]	-	866	1/2	256	128MB (R)/4GB	Rack (5U)	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
851YExx	-	933	1/2	256	128MB (R)/4GB	Tower	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5
85RYExx[1]	-	933	1/2	256	128MB (R)/4GB	Rack (5U)	1/3	P-Optional, H	O-Power	Y	10/100	D,U160	4/2	0/218.4 GB	40X-17X	10/8	5/5

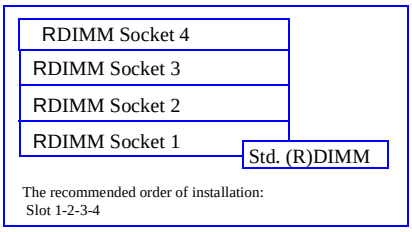
* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance.
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See **Power, Monitors, Accessories** section for supported IBM racks.
2. High-speed, 133 MHz SDRAM.
3. Up to two additional 250 W Hot-Swap Redundant Power Supplies P/N 33L37xx and a single Hot-Swap Power Supply Expansion Kit P/N 37L6881 are required for power supply redundancy. See **Power, Monitors, Accessories** section for additional information.
4. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
5. Intel Pentium III processor with advanced transfer (full-speed) L2 cache and 133 MHz Front-Side Bus.
6. Not available from IBM after this date. Business Partner inventory may be available.

xSeries 230 / Netfinity 5100 Processor Upgrades

Part Number	Processor Upgrades with 256 KB Cache (Full Speed)	SMP Support[1]	Processor Speed Upgrade[2]
00N7949	Netfinity 667 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	1xY	-
00N7943	Netfinity 733 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	2xY	1xY
10K2338	Netfinity 800 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	3xY	All 1...2xY
19K4630	Netfinity 866 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	4xY	All 1...3xY
19K4631[3]	Netfinity 933 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	5xY[3]	-
19K4640	1 GHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	6xY	5xY

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of two processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".
3. Netfinity 933 MHz Upgrade Processor P/N 19K4631 is only supported on models P/N 85xYExx due to thermal restrictions.

xSeries 230 / Netfinity 5100 Memory Configurator



Part Number	Memory Description[1]
33L3123	128 MB 133 MHz SDRAM ECC RDIMM II
33L3125	256 MB 133 MHz SDRAM ECC RDIMM II
33L3127	512 MB 133 MHz SDRAM ECC RDIMM II
33L3129	1 GB 133 MHz SDRAM ECC RDIMM II

1. The recommended order of installation is in sequence from Socket 1 to Socket 4. Memory size is not a factor.

Total Memory[1]	Quantity of RDIMMs Added			
128 MB (1 x 128) Models	128 MB (33L3123)	256 MB (33L3125)	512 MB (33L3127)	1 GB (33L3129)
256 MB	1	-	-	-
384 MB	2 or	1	-	-
512 MB	3	-	-	-
640 MB	-	2 or	1	-
896 MB	-	3	-	-
1024 MB	-	4[2]	-	-
1152 MB	-	-	2 or	1
1664 MB	-	-	3	-
2048 MB	-	-	4[2]	-
2176MB	-	-	-	2
3200 MB	-	-	-	3
4096 MB (max)	-	-	-	4[2]

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.
1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory.

xSeries 230 / Netfinity 5100 Internal Hard Disk Drive and External Storage Configurator

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 37L7201)	18.2 GB (P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 37L7204)	18.2 GB (P/N 37L7205)	36.4 GB (P/N 37L7206)
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4	2	1	4	2	1
45.5 GB	5	-	-	5	-	-
54.6 GB	6	3	-	6	3	-
72.8 GB	-	4	2	-	4	2
91 GB	-	5	-	-	5	-
109.2 GB	-	6	3	-	6	3
145.6 GB	-	-	4	-	-	4
182 GB	-	-	5	-	-	5
218.4 GB (max.)	-	-	6	-	-	6

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.

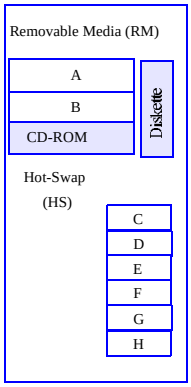
Bay	Form Factor	Height	Front Access	Usage
A	133 mm (5.25”)	HH[1]	Yes	Open
B	133 mm (5.25”)	HH[1]	Yes	Open
-	133 mm (5.25”)	SL	Yes	IDE CD-ROM
-	89 mm (3.5”)	SL	Yes	Diskette

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
Hot-Swap Ultra160 Hard Disk Drives (HDD)					
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	C...H	6
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	C...H	6
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	C...H	6

C...H	HS	SL[2]	Yes	Open

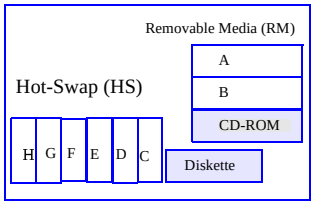
1. Two half-high (HH) bays can be combined to support a single full-high (FH) device. Installation of devices in Bays A or B may require Netfinity Hot-Swap Power Supply Expansion Kit (P/N 37L6881) and at least one Netfinity 250 W Hot-Swap Redundant Power Supply (P/N 33L37xx). Installation of HDDs in Bays A and B also requires Media Bay Tray and LVD Cable Kit (P/N 10K2340).
2. Two slim-line (SL) bays (C/D, E/F, G/H) can be combined to support a single half-high (HH) device.

Tower Model View



For clarity purposes, bay labels in these diagrams are for reference by the accompanying tables and are not the actual labels. Refer to the documentation shipped with the system for further details on actual labels.

Rack Model View



37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	C...H	6
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	C...H	6
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	C...H	6
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	C...H	6
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	C...H	6
Non-Hot-Swap Internal Hard Disk Drives (HDDs)					
20L0553	9.1 GB Wide Ultra2 SCSI HDD[1]	7200	SL	A, B[1]	2
20L0554	18.2 GB Wide Ultra2 SCSI HDD[1]	7200	SL	A, B[1]	2
Associated Options					
10K2340	Media Bay Tray and LVD Cable Kit[2]	-	-	A/B	1
33L37xx[9]	250 W Hot-Swap Redundant Power Supply	-	-	-	-
37L6881	Hot-Swap Power Supply Upgrade Kit[3]	-	-	-	-

External Storage Expansion Units[4]		**Form Factor**
00N6xxx[10]	Netfinity EXP200 Storage Expansion Unit[5, 8]	Rack (3U)
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	-
37L0xxx[11]	Netfinity EXP200 350 W Redundant Power Supply[8]	-
19K11xx[12]	EXP300 Storage Expansion Unit[6, 8]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
00N71xx[13]	FAStT EXP500 Storage Expansion Unit[7, 8]	Rack (3U)
94G7448	Rack Power Cable Type C12 (3.7m)[8]	-

1. Additional power may be required when installing a SCSI device in bay A or B. Configurations exceeding four SL hot-swap hard disk drives and two PCI adapters require both Hot-Swap Power Supply Upgrade Kit P/N 37L6881 and at least one optional 250 W Hot-Swap Redundant Power Supply P/N 33L37xx. Example: 3 SL HS HDD's plus 5 adapters - no additional power supply required. An optional SCSI cable is required. A two-drop terminated LVD SCSI cable is included with both Media Bay Tray and LVD Cable Kit P/N 10K2340 and Hot-Swap Power Supply Upgrade Kit P/N 37L6881.
2. Media Bay Tray and LVD Cable Kit P/N 10K2340 contains a two-drop terminated LVD SCSI cable and the hardware required to convert two half-high 5.25" removable media bays into two non-hot-swap 7200 RPM HDD bays.
3. Hot-Swap Power Supply Upgrade Kit P/N 37L6881 contains a hot-swap power backplane that supports installation for up to three hot-swap power supplies.
4. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
5. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and single hot-swap 350W power supply. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0075) provides redundancy.
6. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies.
7. FAStT EXP500 Storage Expansion Unit (P/N 00N71xx) includes dual hot-swap 350W power supplies.
8. These units do not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order Rack Power Cables according to the number of power supplies.
9. Where 'xx' refers to a country specific code: 60=Saudi Arabia, 61=Europe, 62=Denmark, 63=Israel, 64=Italy, 65=South Africa, 66=Switzerland, 67=United Kingdom&Arabia.
10. Where 'xxx' represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English:- Line Cords/ Publication Country Kits are included throughout.
11. Where 'xxx' represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.
12.Where 'xx' represents a specific country code: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included throughout.
13. Where 'xx' represents a country specific code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English. Country/ Language Line Cords/Publications are included as indicated.

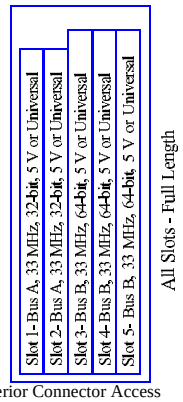
xSeries 230 / Netfinity 5100 Internal SCSI Cabling

The xSeries 230 and Netfinity 5100 contain a DASD backplane supporting six hot-swap, SCA-2 compliant drive bays. The backplane is connected to channel A of the integrated dual-channel, Ultra160 SCSI controller connector through a 16-bit LVD SCSI cable. If internal RAID support is required, this cable can be used to connect to a supported RAID adapter rather than the integrated SCSI controller. No external SCSI port is included.

A two-drop, 16-bit LVD SCSI cable with integrated terminator is also included with the Netfinity Hot-Swap Power Supply Expansion Kit P/N 37L6881.This cable is included in the expansion kit because installation of SCSI devices in bays A and B requires additional power. The two-drop cable supports up to two internal devices in these bays. This cable can be attached to channel B of the integrated dual-channel Ultra160 SCSI controller or to a supported SCSI adapter.

xSeries 230 / Netfinity 5100 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II[2]	Full	32-bit	1...5
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[3]	Full	32/64-bit	1...5
37L6091	ServeRAID-4L Ultra160 SCSI Controller[4]	Full	32/64-bit	1...5
37L6080	ServeRAID-4M Ultra160 SCSI Controller[5]	Full	32/64-bit	1...5
37L6889	ServeRAID-4H Ultra160 SCSI Controller[6]	Full	32/64-bit	1...5
19K4646	PCI Wide Ultra160 SCSI Adapter[15]	Half	32/64-bit	1...5
02K3454	PCI Wide Ultra SCSI Adapter	Half	32-bit	1...5
	Fibre Storage Controller and Options[7]			
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...5
19K11xx[20]	FAStT200 Storage Server	-	-	-
19K11xx[21]	FAStT200 HA Storage Server	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-
	Networking[8]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...5
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1...5
	Token Ring			
34L0701	Token-Ring 16/4 PCIAdapter 2 with Wake on LAN[16]	Half	32-bit	1...5
	Communications[9]			
	Systems Management[10]			
36L96xx[19]	Netfinity Advanced System Management PCI Adapter[11]	Full	32-bit	1...5[12]
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[13]	-	-	-
36L9654	Netfinity Advanced System Management Token-Ring Connection[14]	-	-	-
	Host Attach			
10L7368	Netfinity ESCON Adapter[17]	Full	32-bit	1...5[18]



Exterior Connector Access

1. xSeries 230 / Netfinity 5100 includes a dual-port, dual-channel Ultra160 SCSI controller for internal use only. No standard external port is available. See “Internal SCSI Cabling” for cabling alternatives.
2. Netfinity ServeRAID-3L Ultra2 SCSI Adapter II P/N 19K0564 provides either one internal or one external (0.8-mm VHDCI) LVDS SCSI channel.
3. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides one internal and two external (0.8-mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8-mm VHDCI) providing a total of three external LVDS SCSI channels. Includes 32 MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
4. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
5. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Uoltra160 connectors (only two connectors may be utilised). External connectors are 0.8-mm VHDCI .
6. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilised). External connectors are 0.8-mm VHDCI.
7. See Fibre Array Solutions section for additional configuration information.
8. xSeries 230 / Netfinity 5100 includes a full-duplex, 10/100 Mbps Ethernet PCI controller.
9. xSeries 230 / Netfinity 5100 includes two USB ports, two serial and one parallel port.
10. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into xSeries 230 / Netfinity 4500R works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter (P/N 36L96xx) and Netfinity Advanced System Management Interconnect Cable Kit (P/N 03K9309) additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
11. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter, which requires a separate power source. Provides an integrated 10/100 Ethernet port and a PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection (P/N 36L9654).
12. A maximum quantity of one is supported.
13. Required for all xSeries / Netfinity Servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1xX...4xX are not supported). Optional Netfinity Advanced System Management PCI Adapter (P/N 36L96xx) includes the contents of this option.Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
14 Contains an IBM Turbo 16/4 Token-Ring PCI card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter (P/N 36L96xx), and a PC Card to 9-pin D-Shell cable which is routed to an available adapter slot opening (reduces available slots by one). The Netfinity Advanced System Management PCI Adapter’s integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together.
15. PCI Wide Ultra160 SCSI Adapter P/N 19K4646 provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
16. The Wake on LAN function of this option is not supported by this server.
17. Provides an ESCON MIC and a DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
18. A maximum of two ESCON adapters (installed in non-adjacent slots) are supported in a single server.
19. Where ‘xx’ represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.
20.Where ‘xx’ represents a country specific code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English. Country/Language - Line Cords/Publications are included as indicated
21.Where ‘xx’ represents a country specific code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English. Country/Language - Line Cords/Publications are included as indicated.

xSeries 230 / Netfinity 5100 Power, Monitors, Accessories

Part Number	Description
	Power[1,10]
33L37xx[11]	250 W Hot-Swap Redundant Power Supply[2, 10]
37L6881	Hot-Swap Power Supply Expansion Kit[3]
94G7448	Rack Power Cable Type C12 (3.7m)[10]
	Free Standing Uninterruptible Power Supply (UPS)[4]
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
	Rack Mount Uninterruptible Power Supply (UPS)[4]
14RIxxx[13]	APC Smart-UPS 1400RMB[5]
30RIxxx[13]	APC Smart-UPS 3000RMB[5]
37L6862	APC Smart-UPS 5000RMB[6]
	Monitors[7]
T3347xx[12]	E51 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[8]
31H2Nxx[12]	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[8]
T32N3xx[12]	E74 Color Monitor 17” (403-mm, 15.9” Viewable Image Size), stealth black[8]
T274Axx[12]	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black[8]
11AG1xx[12]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0” Viewable), stealth black[9]

1. xSeries 230 / Netfinity 5100 include a single 250 W, hot-swap power supply and a single standard country power cord. Power supply redundancy may be achieved with the addition of optional 250 W Hot-Swap Redundant Supply P/N 33L37xx. Hot-Swap Power Supply Upgrade Kit P/N 37L6881 is required when optional power supplies are to be added. Redundancy for configurations of greater than 250 W requires installation of a second optional supply. Whenever devices are installed in bays A or B, both the expansion kit and a second power supply are required. Generally, configurations containing greater than six PCI adapters and HDDs, in any combination, will require the second power supply. To assist in determining when an additional power supply is required to preserve redundancy, a “Non-Redundant LED” is a standard feature.
2. 250 W Hot-Swap Redundant Power Supply P/N 33L37xx includes a single standard country power cord for connection to a low voltage wall outlet. Hot-Swap Power Supply Expansion Kit P/N 37L6881 must be installed prior to adding optional power supplies.
3. Hot-Swap Power Supply Expansion Kit P/N 37L6881 includes a hot-swap power backplane, terminated two-drop LVD SCSI cable, and mounting brackets for DLT tape drives. Required when installing a second power supply or devices in the 133-mm (5.25”) HH bays.
4. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
5. Height is 3U. See “Rack and NetBAY” for supported IBM racks.
6. Height is 5U. See “Rack and NetBAY” for supported IBM racks.
7. Netfinity 5100 uses an SVGA controller (S3 Savage4 chipset) with 8 MB of video memory.
8. Installation within a rack requires optional Monitor Compartment P/N 94G7444.
9. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
10. Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered for power connection of a Rack model to a high voltage UPS or PDU.
11. Where ‘xx’ refers to a country specific code: 60=Saudi Arabia, 61=Europe, 62=Denmark, 63=Israel, 64=Italy, 65=South Africa, 66=Switzerland, 67=United Kingdom&Arabia.
12. Where ‘xx’ represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
13. Where ‘xxx’ represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

Part Number	Description
	Conversion Kits
37L6858	5Ux24D Tower-to-Rack Kit
	Rack and NetBAY[1,8]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
9306200	Netfinity NetBAY22
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II
94G7448	Rack Power Cable Type C12 (3.7m)[8]
	Keyboard and Mouse[2]
28L36xx[6]	Space Saver II Keyboard[3, 5]
28L36xx[7]	Preferred Keyboard (stealth black)[4]
28L3675	Sleek 2-Button Stealth Black Mouse

1. xSeries 230 / Netfinity 5100 rack models are housed in a 19" rack mountable drawer and require one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. Tower models include both a keyboard and mouse. Rack models include neither.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
5. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
6. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/ Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
7. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
8. The xSeries 230 / Netfinity 5100 ships with a standard country power cord. For connection of a Rack model to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.

xSeries 230 / Netfinity 5100 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[1]	A, B	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	10L7440, 03K8756[2]
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive[1]	A, B	16	133 mm (5.25") HH	N	N/A	10L7440[3], 03K8756
09N4040	20/40 GB DLT Internal SCSI Tape Drive[1]	A/B	8	133 mm (5.25") FH	N	Y	03K8705[3], 03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive[1]	A/B	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8705[3], 03K8756[2]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive[1]	A, B	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	10L7440[3], 03K8756[2]
	Tape Autoloaders						
00N79xx[11]	DLT Tape Autoloader	N/A	16	Desktop	Y	-	-
00N7992	120/240GB DDS/4 Tape Autoloader[1]	A/B	16 Ultra2 LVD	133 mm (5.25") FH	N	N	03K8756[2]
	External Tape Libraries[4]						
00N79xx[12]	DLT Tape Library	-	16	Desktop orRack	Y	-	-
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[5]	-	8/16	Desktop	N	N	-
03K8705	DLT External SCSI Enclosure[6]		16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[7]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[8]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	10L7440, 03K8705
10K2340	Media BayTray and LVD Cable Kit[1,2,9]	-	16 LVD	Int.	Y	N	-
37L6881	Netfinity Hot-Swap Power Supply Expansion Kit[10]	-	16 LVD	Int.	Y	N	-
33L37xx[13]	250 W Hot-Swap Redundant Power Supply	-	-	-	-	-	-

Note: Additional power may be required when installing a SCSI device in bay A or B. Configurations exceeding four SL hot-swap hard disk drives and two PCI adapters require both Hot-Swap Power Supply Expansion Kit P/N 37L6881 and at least one optional 250 W Hot-Swap Redundant Power Supply P/N 33L37xx. Example: 3 SL HS HDD's plus 5 adapters - no additional power supply required. An optional SCSI cable is required for attachment of media bay devices to Ultra160 controller B. No external SCSI port is available. External tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which has an external 0.8-mm VHDCI connector.
1. Requires two-drop multi-mode terminated LVD SCSI cable included with either Media Bay Tray and LVD Cable Kit P/N 10K2340 or Hot-Swap Power Supply Expansion Kit P/N 37L6881.
2. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit P/N 10K2340.
3. Requires 68-pin External Multimode LVD/SE SCSI terminator P/N 00N7956.
4. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
5. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
6. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator P/ N 00N7956.
7. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
8. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
9. Media Bay Tray and LVD Cable Kit P/N 10K2340 includes an internal two-drop multi-mode terminated LVD SCSI cable.
10. Hot-Swap Power Supply Expansion Kit P/N 37L6881 includes a hot-swap power backplane, and two-drop multi-mode terminated LVD SCSI cable. Required when installing a second power supply.
11. Where 'xx' represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.
12. Where 'xx' represents a country specific power cord code: *Tower versions* - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: *Rack versions* - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.
13. Where 'xx' refers to a country specific code: 60=Saudi Arabia, 61=Europe, 62=Denmark, 63=Israel, 64=Italy, 65=South Africa, 66=Switzerland, 67=United Kingdom&Arabia.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

xSeries 230 / Netfinity 5100 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server

Part Number	Description	Quantity
851YExx	Netfinity 5100 933 MHz/256 KB, 128 MB ECC, OPEN, 40X, PCI	1
33L3123	128 MB 133 MHz SDRAM ECC RDIMM II[1]	1
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD[2]	4
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black	1
SUP102Y	APC Smart-UPS 1000	1
37L6881	Hot-Swap Power Supply Expansion Kit	1
33L37xx	250 W Hot-Swap Redundant Power Supply	1

1. For a total of 256 MB of system memory.
2. For a total of 36.4 GB of RAID protected hot-swap, hot-spare internal storage.

An internet server is a server that handles all requests from the Internet (intranet or extranet). Usually this type of server has the same characteristics as a file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (Firewall). In the case of an internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this in mind the xSeries 230 was selected to provide an affordable price point for the growing internet server market, 256 MB of system memory (expandable to 4 GB, and availability features such as RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the internet. Usually fast Ethernet routers are used, but if other methods are used, you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
K861Yxx	xSeries 230 1 GHz/256 KB, 128 MB ECC, OPEN, 40X, PCI	1
33L3123	128 MB 133 MHz SDRAM ECC RDIMM II[1]	1
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD[2]	5
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black	1
SUP102Y	APC Smart-UPS 1000	1
37L6881	Hot-Swap Power Supply Expansion Kit	1
33L37xx	250 W Hot-Swap Redundant Power Supply	1

1. For a total of 256 MB of system memory.
2. For a total of 45.5 GB of RAID protected hot-swap, hot-spare internal storage.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn’t require the high end performance and fault tolerance properties of larger servers.

The sample configuration above consists of an xSeries 230 with 256 MB of memory (expandable to 4 GB) and 45.5 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

The configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected during power surges and outages.

Rack Mounted Application Server

Part Number	Description	Quantity
85RYExx	Netfinity 5100 933 MHz/256 KB, 128 MB ECC, OPEN, 40X, PCI (Rack 5U)	1
19K4631	933 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	1
33L3125	256 MB 133 MHz SDRAM ECC RDIMM II[1]	1
37L6080	ServeRAID-4M Ultra160 SCSI Controller	1
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD[2]	5
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black	1
14RIxxx	APC Smart-UPS 1400RMB	1
33L37xx	250 W Hot-Swap Redundant Power Supply	1
37L6881	Hot-Swap Power Supply Expansion Kit	1
	Industry Standard 19” Rack, EIA-310D, min. depth of 28” (711 mm)	
9306200	Netfinity NetBAY22	1
28L36xx	Space Saver II Keyboard	1
28L3645	Blank Filler Kit	2

1. For a total of 384 MB of system memory.
2. For a total of 36.4 GB of usable RAID 5 storage (45.5 GB total disk).

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the xSeries 230 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 384 MB of system memory (expandable to 4 GB), and availability features such as battery-backed cache, RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

To access IBM information specific to your country via the World Wide Web, use address: http://www.pc.ibm.com

IBM xSeries 240 and Netfinity 5600

Part Number*	Withdrawal Date: ddmmyy[6]	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R=RDIMM)[3]	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[5]	Bays: (Tot/Av)	Slots: (Tot/Av)
xSeries 240 / Netfinity 5600 At-A-Glance Chart																	
xSeries 240																	
K481Yxx	-	1 GHz	1/2	256	256MB (R)/4GB	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
K48RYxx[1]	-	1 GHz	1/2	256	256MB (R)/4GB	Rack(5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
Netfinity 5600																	
441YExx	24/10/00	733	1/2	256	256MB (R)/4GB	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
44RYExx[1]	24/10/00	733	1/2	256	256MB (R)/4GB	Rack (5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
451YExx	-	800	1/2	256	256MB (R)/4GB	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
45RYExx[1]	-	800	1/2	256	256MB (R)/4GB	Rack (5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
461YExx	-	866	1/2	256	256MB (R)/4GB	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
46RYExx[1]	-	866	1/2	256	256MB (R)/4GB	Rack (5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
471YExx	-	933	1/2	256	256MB (R)/4GB	Tower	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5
47RYExx[1]	-	933	1/2	256	256MB (R)/4GB	Rack (5U)	2/3	P, S,H,F	S-Power[4] S-Fans	Y	10/100	D,U2	4/2	0/218.4 GB	40X- 17X	10/8	5/5

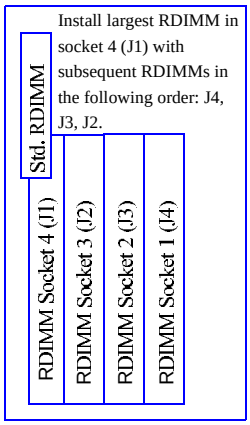
* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance.
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III processor with advanced transfer (full speed) L2 cache and 133 Mhz Front-Side Bus.
3. High-speed, 133 MHz SDRAM.
4. Robust configurations may require optional 250W Hot-Swap Redundant Power Supply P/N 33L37xx for redundancy. See **Power, Monitor, Accessories** section for additional information.
5. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
6. Not available from IBM after this date. Business Partner inventory may be available.

xSeries 240 / Netfinity 5600 Processor Upgrades

Part Number	Processor Upgrades with 256 KB Cache (Full Speed)	SMP Support[1]	Processor Speed Upgrade[2]
00N7943	Netfinity 733 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	4xY	All 1...3xY
10K2338	Netfinity 800 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	5xY	All 1...4xY
19K4630	Netfinity 866 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	6xY	All 1...5xY
19K4631	Netfinity 933 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	7xY	All 1...6xY
19K4640	1 GHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	8xY	-

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of two processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 240 / Netfinity 5600 Memory Configurator



Part Number	Memory Description[1]
33L3058	128 MB, 133 MHz SDRAM ECC RDIMM
33L3060	256 MB, 133 MHz SDRAM ECC RDIMM
33L3062	512 MB, 133 MHz SDRAM ECC RDIMM
33L3064	1 GB, 133 MHz SDRAM ECC RDIMM

1. Install largest RDIMM in socket 4 (J1) with subsequent RDIMMs in the following order: J4, J3, J2.

	Standard Memory			
	256MB Models			
Total Memory[1]				
256 MB	-	-	-	-
384 MB	1	-	-	-
512 MB	-	1	-	-
640 MB	1	1	-	-
896 MB	-	1	1	-
1024 MB	-	1	1	-
1152 MB	1	1	1	-
1664 MB	1	1	-	1
2048 MB	-	1	1	1
2304MB	-	-	-	2
3200 MB	-	-	-	-
3328 MB	-	-	-	3
4096 MB (max)	-	-	-	4[2]
	128MB	**256MB**	**512MB**	**1GB**
	Memory RDIMMs to be added			

This table does not represent all possible memory configurations.
1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory.

xSeries 240 / Netfinity 5600 Internal Hard Disk Drive and External Storage Configurator

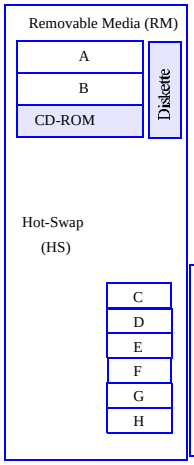
Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 37L7201)[2]	18.2 GB (P/N 37L7202)[2]	36.4 GB (P/N 37L7203)[2]	9.1 GB (P/N 37L7204)[2]	18.2 GB (P/N 37L7205)[2]	36.4 GB (P/N 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4	2	1	4	2	1
45.5 GB	5	-	-	5	-	-
54.6 GB	6	3	-	6	3	-
72.8 GB	-	4	2	-	4	2
91 GB	-	5	-	-	5	-
109.2 GB	-	6	3	-	6	3
145.6 GB	-	-	4[3]	-	-	4[3]
182 GB	-	-	5[3]	-	-	5[3]
218.4 GB (max.)	-	-	6[3]	-	-	6[3]

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2.Netfinity 5600 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.

Bay	Form Factor	Height	Front Access	Usage
A	133 mm (5.25”)	HH[1]	Yes	Open
B	133 mm (5.25”)	HH[1]	Yes	Open
-	133 mm (5.25”)	HH	Yes	IDE CD-ROM
-	89 mm (3.5”)	SL	Yes	Diskette
C...H	HS	SL[2]	Yes	Open

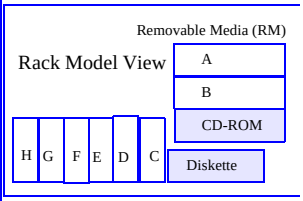
1. Two half-high (HH) bays can be combined to support a single full-high (FH) device
2. Two slim-line (SL) bays can be combined to support a single half-high (HH) device.

Tower Model View



For clarity purposes, bay labels in these diagrams are for reference by the accompanying tables and are not the actual labels. Refer to the documentation shipped with the system for further details on actual labels.

Rack Model View



Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
	Ultra160 Hard Disk Drives (HDD)[1]				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	C...H	6
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	C...H	6
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	C...H	6
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	C...H	6
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	C...H	6
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	C...H	6
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	C...H	6
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	C...H	6
	Non-Hot-Swap Internal Hard Disk Drives (HDD)				
20L0553	9.1 GB Wide Ultra2 SCSI HDD[2]	7200	SL	A, B[2]	2
20L0554	18.2 GB Wide Ultra2 SCSI HDD[2]	7200	SL	A, B[2]	2
	Associated Options				
10K2340	Media Bay Tray and LVD Cable Kit	-	-	A/B	1
	External Storage Expansion Units[3]	**Form Factor**			
00N6xxx[8]	Netfinity EXP200 Storage Expansion Unit[4, 7]	Rack (3U)			
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	Tower			
37L0xxx[9]	Netfinity EXP200 350 W Redundant Power Supply[7]	-			
19K11xx[10]	EXP300 Storage Expansion Unit[5, 7]	Rack (3U)			
09N7296	EXP300 Rack-to-Tower Conversion Kit	-			
00N71xx[11]	FAStT EXP500 Storage Expansion Unit[6, 7]	Rack (3U)			
94G7448	Rack Power Cable Type C12 (3.7m)[7]	-			

1. Netfinity 5600 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Requires Media Bay Tray and LVD Cable Kit P/N 10K2340. Media Bay Tray and LVD Cable Kit converts two half-high 5.25” removable media bays into two non-hot-swap HDD bays.
3. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to see Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
4. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply. Optional hot-swap Netfinity EXP 350 W Redundant Power Supply P/N 37L0xxx provides redundancy. To convert and EXP200 to a tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit P/N 37L5857 is required.
5. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500 W redundant power supplies. To convert an EXP300 to a tower form factor, Netfinity EXP300 Rack-to-Tower Conversion Kit P/N 09N7296 is required.
6. FAStT EXP500 Storage Expansion Unit P/N 00N71xx includes dual hot-swap 350 W power supplies.
7. These units do not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order Rack Power Cables according to the number of power supplies.
8. Where ‘xxx’ represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English:- Line Cords/ Publication Country Kits are included throughout.
9. Where ‘xxx’ represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.
10. Where ‘xx’ represents a specific country code: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included throughout.
11. Where ‘xx’ represents a country specific code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English. Country/Language Line Cords/Publications are included as indicated.

xSeries 240 / Netfinity 5600 Internal SCSI Cabling

The xSeries 240 and Netfinity 5600 contain a backplane supporting six hot-swap drive bays. The backplane is connected to the integrated dual channel, wide Ultra2 SCSI controller connector through a 16-bit LVD SCSI cable. If internal RAID support is required, this cable can be used to connect to a supported RAID adapter rather than the integrated SCSI controller. A two-drop, 16-bit SCSI cable with integrated terminator is also included with the server to support up to two internal removable media devices. This cable can be attached to the integrated SCSI controller if a RAID adapter is used to support the internal hot-swap drive bays. It can also be used to attach to a supported SCSI adapter if the integrated Ultra2 SCSI controller is utilised for the hot-swap bays. The second channel is available through an industry-standard 0.8-mm very high density connector interface (VHDCI) located on the rear panel for external use.

xSeries 240 / Netfinity 5600 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported	Hot-Plug[2]
	Storage Controllers[1]				
01K7364	Netfinity ServeRAID-3L Ultra2 SCSI Adapter[3]	Full	32-bit	1...5	X
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[4]	Full	32/64-bit	1...5	X
37L6091	ServeRAID-4L Ultra160 SCSI Controller[5]	Full	32/64-bit	1...5	X
37L6080	ServeRAID-4M Ultra160 SCSI Controller[6]	Full	32/64-bit	1...5	X
37L6889	ServeRAID-4H Ultra160 SCSI Controller[7]	Full	32/64-bit	1...5	X
19K4646	PCI Wide Ultra160 SCSI Adapter[8]	Half	32/64-bit	1...5	-
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1...5	-
	Fibre Storage Controller and Options[9]				
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...5	X
19K11xx[22]	FAStT200 Storage Server	-	-	-	-
19K11xx[23]	FAStT200 HA Storage Server	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-	-
	Networking[10]				
	Ethernet				
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...5	X
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...5	X
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1...5	X
	Token Ring				
34L5001	16/4 Token-Ring PCI Management Adapter[20]	Half	32-bit	1...5	X
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter	Half	32-bit	1...5	X
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[20]	Half	32-bit	1...5	X
	Communications[11]				
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[12]	Half	32-bit	1...5[12]	-
	Systems Management[13]				
36L96xx[21]	Netfinity Advanced System Management PCI Adapter[14]	Full	32-bit	1...5[15]	-
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[16]	-	-	-	-
36L9654	Netfinity Advanced System Management Token-RIng Connection[17]	-	-	-	-
	Host Attach				
10L7368	Netfinity ESCON Adapter[18]	Full	32-bit	1...5[19]	-

Rack Model

Slot 5- PCI, Hot-Plug, 32/64-bit, Full Length	Slot 4- PCI, Hot-Plug, 32/64-bit, Full Length	Slot 3- PCI, Hot-Plug, 32/64-bit, Full Length	Slot 2- PCI, 32-bit, Full Length	Slot 1- PCI, 32-bit, Full Length

1. xSeries 240 / Netfinity 5600 has two integrated Wide Ultra2 SCSI channels. One is internal and the other is external with a 0.8-mm Very High Density Connection Interface (VHDCI).
2. Three of the five PCI slots are 32/64-bit hot-plug capable using IBM's Active PCI technology. For Network Operating System support access URL www.ibm.com/pc/us/compat.
3. Netfinity ServeRAID-3L Ultra2 SCSI Adapter P/N 01K7364 provides either one internal or one external (0.8-mm VHDCI) LVDS SCSI channel.
4. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides one internal and 2 external (0.8-mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8-mm VHDCI connector) providing a total of 3 external LVDS SCSI channels. Includes 32MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
5.ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connectors are 0.8-mm VHDCI..
6. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI.
7.ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilised). External connectors are 0.8-mm VHDCI.
8. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
9. See Fibre Array Solutions section for additional configuration information.
10. xSeries 240 / Netfinity 5600 has an integrated 10/100 PCI Ethernet Controller.
11. xSeries 240 / Netfinity 5600 includes two USB ports, three high-speed serial/asynchronous ports, (two NS16550A compatible, one for the Advanced System Management Processor), and one high-speed (up to 2 MB/sec. data transfer speed) bi-directional parallel port supporting devices using ECP/EPP/SSP protocols adhering to the IEEE 1284 standard.
12. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (any combination of P/N 37L1414, 37L1415, 37L1416) may be installed.
13. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into xSeries 240 / Netfinity 5600 works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter (P/N 36L96xx) and Netfinity Advanced System Management Interconnect Cable Kit (P/N 03K9309) additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
14. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter which requires a separate power source. Provides an integrated 10/100 Ethernet port and PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection (P/N 36L9654).
15. A maximum quantity of one is supported.
16. Required for all xSeries and Netfinity servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1xX...4xX are not supported). Optional Netfinity Advanced System Management PCI Adapter (P/N 36L96xx) includes the content of this option.
Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
17. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter (P/N 36L96xx), and a PC Card to 9-pin D-Shell cable which is routed to a rear chassis cut-out. The Netfinity Advanced System Management PCI Adapter integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together.
18. Provides an ESCON MIC and DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
19. A maximum of two ESCON adapters (installed in non-adjacent slots) are supported in a single server.
20. The Wake on LAN function of this option is not supported by this server.
21. Where 'xx' represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.
22.Where 'xx' represents a country specific code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English. Country/Language - Line Cords/Publications are included as indicated
23.Where 'xx' represents a country specific code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English. Country/Language - Line Cords/Publications are included as indicated.

xSeries 240 / Netfinity 5600 Power, Monitors, Accessories

Part Number	Description
	Power[1,8]
33L37xx[10]	250 W Hot-Swap Redundant Power Supply[8]
94G7448	Rack Power Cable Type C12 (3.7m)[8]
	Free Standing Uninterruptible Power Supply (UPS)[2]
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
	Rack Mount Uninterruptible Power Supply (UPS)[2]
14RIxxx[11]	APC Smart-UPS 1400RMB[3]
30RIxxx[11]	APC Smart-UPS 3000RMB[3]
37L6862	APC Smart-UPS 5000RMB[4]
	Monitors[5]
T3347xx[9]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
31H2Nxx[9]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T32N3xx[9]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
T274Axx[9]	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[6]
11AG1xx[9]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[7]

1. xSeries 240 / Netfinity 5600 include two 250W hot-swap power supplies, each with its own standard country power cord. These standard power supplies are sufficient to operate fully configured systems; however optional 250W Hot-Swap Redundant Power Supply P/N 33L37xx is required to preserve redundancy if any of the following are exceeded:
Single Processor Configuration: Six SL hard disk drive (HDDs) and two PCI adapters (1 HH HDD = 2 SL, 1 tape = 2 SL, 1 PCI adapter = 2 SL)
e.g. To preserve power supply redundancy with 3 PCI adapters only 4 SL HDDs can be installed before an optional power supply is required.
Dual Processor Configuration: Four SL hard disk drives (HDDs) and two PCI adapters (1 HH HDD = 2 SL, 1 tape = 2 SL, 1 PCI adapter = 2 SL)
A "non-redundant" LED on the system unit will indicate when 250W has been exceeded. 250 W Hot-Swap Redundant Power Supply (P/N 33L37xx) includes a standard country power cord which requires an additional power source. An independent power source such as a second UPS or second circuit is not required.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. xSeries 240 / Netfinity 5600 use an SVGA controller (S3 Trio 3D chipset) with 4 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment P/N 94G7444.
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
8. Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered for power connection of a Rack model to a high voltage UPS or PDU.
9. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
10. Where 'xx' refers to a country specific code: 60=Saudi Arabia, 61=Europe, 62=Denmark, 63=Israel, 64=Italy, 65=South Africa, 66=Switzerland, 67=United Kingdom&Arabia.
11. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

Part Number	Description
	Conversion Kits
37L6858	5Ux24D Tower-to-Rack Kit
	Rack and NetBAY[1,8]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
9306200	Netfinity NetBAY22
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II
94G7448	Rack Power Cable Type C12 (3.7m)[8]
	Keyboard and Mouse[2]
28L36xx[6]	Space Saver II Keyboard[3, 5]
28L36xx[7]	Preferred Keyboard (stealth black)[4]
28L3675	Sleek 2-Button Stealth Black Mouse

1. xSeries 240 / Netfinity 5600 rack models are housed in a 19" rack mountable drawer and require one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. Tower models include both a mouse and a keyboard. Rack models include neither.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
5. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
6. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
7. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
8. The xSeries 240 / Netfinity 5600 ships with a standard country power cord. For connection of a Rack model to a high voltageUPS or PDU, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.

xSeries 240 / Netfinity 5600 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
09N4042	10/20 GB NS Internal SCSI Tape Drive[1]	A, B	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	10L7440
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[2]	A, B	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	10L7440, 03K8756[3]
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive[1]	A, B	16	133 mm (5.25") HH	N	N/A	10L7440[4], 03K8756
09N4040	20/40 GB DLT Internal SCSI Tape Drive[1]	A/B	8	133 mm (5.25") FH	N	Y	03K8705[4], 03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive[2]	A/B	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8705[4], 03K8756[3]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive[2]	A, B	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	10L7440[4], 03K8756[3]
	Tape Autoloaders						
00N79xx[11]	DLT Tape Autoloader	N/A	16	Desktop	Y	-	-
00N7992	120/240GB DDS/4 Tape Autoloader[2]	A/B	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[3]
	External Tape Libraries[5]						
00N79xx[12]	DLT Tape Library	-	16	Desktop orRack	Y	-	-
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[6]	-	8/16	Desktop	N	N	-
03K8705	DLT External SCSI Enclosure[7]		16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[8]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[9]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	10L7440, 03K8705
10K2340	Media BayTray and LVD Cable Kit[2,3,10]	-	16 LVD	Int.	Y	N	-

Note: Netfinity 5600 includes a wide two-drop single-ended terminated cable which can be used for attachment of internal tape drives to the onboard Ultra2 controller when the hot-swap backplane is attached to a RAID controller. If LVD support is required, an optional LVD cable must be ordered. An external Ultra2 SCSI port is available with a 0.8-mm VHDCI connector. External tape enclosures are supported by the standard external SCSI port or PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8-mm VHDCI connector.

1. Non-RAID Configurations: Requires PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which contains a five-drop multi-mode terminated LVD SCSI cable.
2. RAID configurations: Configurations where the hot-swap backplane is cabled to a RAID controller, require the two-drop multi-mode terminated LVD SCSI cable included with Media Bay Tray and LVD Cable Kit (P/N 10K2340) for support of LVD devices in LVD mode. Use of the included single-ended terminated cable with an LVD device will be limited to single-ended SCSI rules.
3. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340).
4. Requires 68-pin External Multimode LVD/SE SCSI terminator (P/N 00N7956).
5. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
6. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
7. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator (P/N 00N7956).
8. NetMEDIA Storage Expansion Unit EL (P/N 03K8756) is a black 3U, 19" rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
9. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
10. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.
11. Where 'xx' represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.
12. Where 'xx' represents a country specific power cord code: *Tower versions* - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: *Rack versions* - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

xSeries 240 / Netfinity 5600 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

High Availability Application Server

Part Number	Description	Quantity	Usage
471YExx	Netfinity 5600 933 MHz/256 KB, 256 MB ECC, Open, 40X, PCI	1	-
33L3060	256 MB, 133 MHz SDRAM ECC RDIMM	1	512 MB total system memory
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	2	9.1 mirrored for NOS
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	4	36 GB RAID 5 with hot-spare
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1	-
37L6091	ServeRAID-4L Ultra160 SCSI Controller	1	RAID 1 for OS, RAID 5 for data
33L37xx	250 W Hot-Swap Redundant Power Supply	1	Full power redundancy
31H2Nxx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[6]	1	
SUP102Y	APC Smart-UPS 1000	1	UPS

This tower server is configured to act as the foundation for business critical applications, applications your business cannot afford to be without. Configured with enough disk drives to mirror the operating system and provide a standard RAID 5 environment for data, optional hot-swap redundant power and UPS for power even during a blackout, this server represents the leading edge in high availability. An internal tape drive is included to back up that all important asset...data. A modem could be included to allow out-of-band (non-LAN) system management utilizing the integrated Netfinity Advanced System Management Processor.

High Availability File Server

Part Number	Description	Quantity	Usage
K481Yxx	xSeries 240 1 GHz/256KB, 256 MB ECC, Open, 40X, PCI	1	-
37L7204	9.1 GB 10K-4 Ultra2 SCSI Hot-Swap SL HDD	6	45 GB available disk and one hot spare
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1	
37L6889	ServeRAID-4H Ultra160 SCSI Controller	1	RAID 5 array, with hot-spare
33L37xx	250 W Hot-Swap Redundant Power Supply	1	Full power redundancy
31H2Nxx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[6]	1	-
SUP102Y	APC Smart-UPS 1000	1	-

This tower model is configured to meet the need of server consolidation. Many businesses are trying to get their arms around the dispersed departmental servers that have grown up around the enterprise. By moving multiple servers onto one platform there is only one system to manage, both hardware and software. There is potentially less expensive for service, software licenses, etc., and there is no need to worry about putting all your eggs in one basket because the xSeries240 is designed for high availability. This configuration includes 56 GB of internal HDD storage, features a third power supply which provides fully redundant power, a UPS to help protect the system against a momentary electricity loss, and an internal tape drive that backs up, up to 40 GB per tape...in addition to all the standard features of the xSeries 240.

IBM xSeries 330

Part Number*	Withdrawal Date: ddmmyy	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std	CD-ROM (IDE)[3]	Bays: (Tot/Av	Slots:
K411Yxx[1]	-	800	1/2	256	256MB(R)/4GB	Rack(1U)	1/1	H	Y	10/100	U160	-	0/72.8GB	24X-10X	4/2	2/2
K431Yxx[1]	-	866	1/2	256	256MB(R)/4GB	Rack(1U)	1/1	H	Y	10/100	U160	-	0/72.8GB	24X-10X	4/2	2/2
K441Yxx[1]	-	933	1/2	256	256MB(R)/4GB	Rack(1U)	1/1	H	Y	10/100	U160	-	0/72.8GB	24X-10X	4/2	2/2
K451Yxx[1]	-	1GHz	1/2	256	256MB(R)/4GB	Rack(1U)	1/1	H	Y	10/100	U160	-	0/72.8GB	24X-10X	4/2	2/2

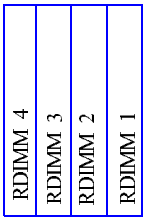
* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance.
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "xSeries 330 Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III processor with advanced transfer (full speed) L2 cache and 133 MHz Front-Side Bus (FSB).
3. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.

xSeries 330 Processor Upgrades

Part Number	Processor Upgrades with 256 KB Cache (Full Speed)	SMP Support[1]	Processor Speed Upgrade[2]
10K3810	800 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	11Y	-
10K3806	866 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	31Y	11Y
10K0052	933 MHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	41Y	11Y/31Y
10K0053	1 GHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	51Y	11Y/31Y/41Y

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of two processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 330 Memory Configurator



Part Number	Memory Description[1]
33L3142	128 MB, 133 MHz SDRAM ECC RDIMM II
33L3144	256 MB, 133 MHz SDRAM ECC RDIMM II
33L3146	512 MB, 133 MHz SDRAM ECC RDIMM II
33L3152	1 GB, 133 MHz SDRAM ECC RDIMM II

1. Memory RDIMMs must be installed in sequence from RDIMM connector 1 through connector 4. RDIMM size is not relevent.

Total Memory[1]	Quantity of RDIMMs Added			
256 MB (1 x 256) Models	128 MB (33L3123)	256 MB (33L3125)	512 MB (33L3127)	1 GB (33L3129)
384MB	1	-	-	-
512 MB	2 or	1	-	-
640 MB	3	-	-	-
768 MB	-	2 or	1	-
1024 MB	-	3	-	-
1280 MB	-	-	2 or	1
1792 MB	-	-	3	-
2048 MB	-	-	4[2]	-
2304 MB	-	-	-	2
3328 MB	-	-	-	3
4096 MB (max)	-	-	-	4[2]

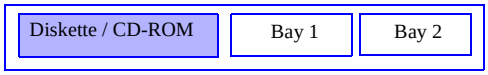
This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.
1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory.

xSeries 330 Internal Hard Disk Drive and External Storage Configurator

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 37L7201)	18.2 GB (P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 37L7204)	18.2 GB (P/N 37L7205)	36.4 GB (P/N 37L7206)
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2 or	1	-	2 or	1	-
36.4 GB	-	2 or	1	-	2 or	1
72.8 GB	-	-	2	-	-	2

This table does not represent all possible hard drive configurations.

1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.



Bay	Form Factor	Height	Front Access	Usage
1[1]	89 mm (3.5")	HS	Yes	Open
2	89 mm (3.5")	HS	Yes	Open

1. Boot drive should be located in bay 1.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
	Ultra160 Hard Disk Drives (HDD)				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...2	2
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...2	2
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...2	2
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...2	2
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...2	2
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...2	2

	External Storage Expansion Units[1]	Form Factor
00N6xxx[6]	Netfinity EXP200 Storage Expansion Unit[2, 5]	Rack (3U)
37L0xxx[7]	Netfinity EXP200 350 W Redundant Power Supply[5]	-
19K11xx[8]	EXP300 Storage Expansion Unit[3, 5]	Rack (3U)
00N71xx[9]	FAStT EXP500 Storage Expansion Unit[4, 5]	Rack (3U)
94G7448	Rack Power Cable Type C12 (3.7m)[5]	-

1. xSeries 330 does not include an external SCSI connector. Select an optional SCSI controller and then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
2. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0xxx) provides redundancy.
3. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies.
4. FAStT EXP500 Storage Expansion Unit (P/N 00N71xx) includes dual hot-swap 350W power supplies.
5. These units do not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order Rack Power Cables according to the number of power supplies.
6. Where 'xxx' represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English:- Line Cords/ Publication Country Kits are included throughout.
7. Where 'xxx' represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.
8.Where 'xx' represents a specific country code: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included throughout.
9. Where 'xx' represents a country specific code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English. Country/ Language Line Cords/Publications are included as indicated.

xSeries 330 Internal SCSI Cabling

xSeries 330 contains a DASD backplane supporting two hot-swap, SCA-2 compliant drive bays. The backplane is connected to one of the internal connectors of the integrated Ultra160 SCSI controller through a 16-bit LVD SCSI cable. If internal RAID is required, the cable can be attached to the internal connector of the optional RAID adapter. The cable is of sufficient length to attach to adapters in slot 1 but not slot 2.

In configurations where external SCSI device attachment is required, a supported SCSI adapter or ServeRAID controller must be installed.

xSeries 330 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
37L6091	ServeRAID-4L Ultra160 SCSI Controller[2]	Full	32/64-bit	1
37L6080	ServeRAID-4M Ultra160 SCSI Controller[3]	Full	32/64-bit	1
37L6889	ServeRAID-4H Ultra160 SCSI Controller[4]	Full	32/64-bit	1
19K4646	PCI Wide Ultra160 SCSI Adapter[5]	Half	32/64-bit	1, 2
02K3454	PCI Fast/Wide Ultra SCSI Adapter[6]	Half	32-bit	1, 2
	Fibre Storage Controller and Options[7]			
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1, 2
19K11xx[14]	FAStT200 Storage Server	-	-	-
19K11xx[15]	FAStT200 HA Storage Server	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-
	Networking[8]			
	Ethernet			
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1, 2
19K4401	Netfinity Gigabit Ethernet Adapter	Half	32/64-bit	1, 2
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1, 2
34L4601	Netfinity 10/100 Ethernet Security Adapter	Half	32/64-bit	1, 2
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter2 with Wake on LAN[9]	Half	32-bit	1, 2
34L5001	16/4 Token-Ring PCI Management Adapter[9]	Half	32-bit	1, 2
34L5201	High-Speed 100/16/4 Token-Ring PCI Management Adapter	Half	32-bit	1, 2
	Communications[10]			
37L14xx	Serial I/O SST 8, 16 and 128 port adapters[11]	Half	32-bit	1, 2
	Systems Management[12]			
36L96xx[13]	Netfinity Advanced System Management PCI Adapter	Full	32-bit	1
03K9309	Netfinity Advanced System Management Interconnect Cable Kit	-	-	-
36L9654	Netfinity Advanced System Management Token-Ring Connection	-	-	-

Exterior Connector Access

1. xSeries 330 has an integrated single channel Ultra160 SCSI Controller.
2. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
3. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two external 0.8-mm VHDCI Ultra160 connectors.
4. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz Power PC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilized). External connectors are 0.8-mm VHDCI.
5. PCI Wide Ultra160 SCSI Adapter P/N 19K4646 provides a single channel with one internal connector and one external 0.8-mm VHDCI Ultra160 connector. Support for external SCSI devices only. A five-drop terminated LVD SCSI cable is included but not supported for use in this server.
6. For use in supporting external SCSI devices such as tape drives.
7. See the Fibre Array Solutions section for additional configuration information.
8. xSeries 330 includes dual full-duplex, 10/100 Mbps Ethernet controllers.
9. The Wake on LAN function of this option is not supported by this server.
10. xSeries 330 includes two USB ports and a high speed serial/asynchronous port (NS16550A compatible).
11. See Appendix E for details on Serial I/O options and configuration limitations.
12. xSeries 330 has a single integrated system management port and a single RS485 port.
13. Where 'xx' represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi
14.Where 'xx' represents a country specific code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English. Country/Language - Line Cords/Publications are included as indicated
15.Where 'xx' represents a country specific code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English. Country/Language - Line Cords/Publications are included as indicated.

xSeries 330 Power, Monitors, Accessories

Part Number	Description
	Power[1,8]
	Uninterruptible Power Supply (UPS)[2]
14RIxxx[10]	APC Smart-UPS 1400RMB[3]
30RIxxx[10]	APC Smart-UPS 3000RMB[3]
37L6862	APC Smart-UPS 5000RMB[4]
94G7448	Rack Power Cable Type C12 (3.7m)[8]
	Monitors[5]
06P4792	Cable Chain Technology Cable Kit[5]
T3347xx[9]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
31H2Nxx[9]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T32N3xx[9]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
T274Axx[9]	G78 Color Monitor 17" (406.4mm, 16.0" Viewable Image Size), stealth black[6]
11AG1xx[9]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable Image Size), stealth black[7]

1. The xSeries 330 includes a worldwide, voltage sensing 200 W power supply and a standard country power cord.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. The xSeries 330 uses an SVGA controller (S-3 Savage4 chipset) with 8Mb of video memory. A Cable Chain Technology Cable Kit P/N 06P4792 is required for the attachment of console devices to one or multiple chained xSeries 330s. The kit contains a 2M (6.5 feet) KVM breakout cable for attachment to a keyboard. mouse and monitor, as well as a 2 M (6.5 feet) KVM chaining cable for connecting two xSeries 330s together when the standard 245 mm (9.6 inches) KVM chaining cable is not long enough, A maximum of 42 xSeries 330s are supported in a single chain. No more than one kit may be used.
6. Installation within a rack requires optional Monitor Compartment P/N94G7444.
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
8. Rack Power Cable P/N 94G7448 must be ordered for power connection of a rack model to a high voltage UPS or PDU.
9. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
10. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe

Part Number	Description
	Rack and NetBAY[1,2,10]
930842P	Netfinity Enterprise Rack[4]
930842X	Netfinity Enterprise Expansion Cabinet[4]
9306900	Netfinity Rack[2, 5]
06P6010	Netfinity Rack Front Door Kit[3]
9306910	Netfinity Rack (includes perforated front door)[5]
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22[4, 5]
36L9702	NetBAY22 Rack Extension Kit
36L9701	Netfinity NetBAY3E[4, 6]
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II
94G7448	Rack Power Cable Type C12 (3.7m)[10]
	Keyboard and Mouse[7]
06P4792	Cable Chain Technology Cable Kit[7]
28L36xx[11]	Space Saver II Keyboard[8]
28L36xx[12]	Preferred Keyboard (stealth black)[9]
28L3675	Sleek 2-button Stealth Black Mouse

1. xSeries 330 is housed in a 19" rack mountable drawer and requires one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices. To provide adequate cooling, Blank Filler Panel Kit P/N 94G6670 should be placed on the front of any unused rack space. If non-IBM racks are to be used, assure that both the front and rear doors offer a minimum of 48% open area uniformely distributed and in line with installed servers. A clearance of 51 to 64-mm (2 to 2-1/2 inches) must be maintained between the front door and the system unit's front bezel. The rear door must maintain the same or greater clearance. Clearance between the EIA mounting rails and rack side covers must be less than 13-mm (1/2 - inch) to prevent air re-circulation from back to front. Non-rack or NetBAY3E installations are not supported.
2. To enable proper cooling, optional Netfinity Rack Front Door Kit P/N 06P6010 must be installed or the front door must be removed. See also Rack P/N 9306910.
3. Provides a perforated front door replacement for the standard glass door of a Netfinity Rack P/N 9306900.
4. To enable proper cooling, the front door (bezel for NetBAY3E) must be removed.
5. Although not required, the use of an appropriate Extension Kit is recommended
6. Up to three xSeries 330s are supported for installation in a NetBAY3E. and up to three NetBAY3Es are supported while installed beneath a Netfinity 8500R. An 8500R must be installed on top of the NetBAY3E.
7. A Cable Chain Technology Cable Kit P/N 06P4792 is required for the attachment of console devices to one or multiple chained xSeries 330s. The kit contains a 2M (6.5 feet) KVM breakout cable for attachment to a keyboard. mouse and monitor, as well as a 2 M (6.5 feet) KVM chaining cable for connecting two xSeries 330s together when the standard 245 mm (9.6 inches) KVM chaining cable is not long enough, A maximum of 42 xSeries 330s are supported in a single chain. No more than one kit may be used.
8. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
9. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
10. The xSeries 330 ships with a standard country power cord. For connection to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.
11. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
12. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.

xSeries 330 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
09N4041	12/24 GB DDS/4 4-mm Internal SCSI Tape Drive	N/A[1]	8	89 mm (3.5") HH or 133 mm (5.25") HH	Y	Y	03K8756
09N4042	10/20GB NS Internal SCSI Tape Drive	N/A[1]	8	89 mm (3.5") SL or 133 mm (5.25") HH	Y	Y	03K8756
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	N/A[1]	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	03K8756[2]
09N4040	20/40 GB DLT Internal SCSI Tape Drive	N/A[1]	8	133 mm (5.25") FH	N	Y	03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[2]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[2]
	Tape Autoloaders						
00N7992	120/240GB DDS/4 Tape Autoloader	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[2]
	External Tape Libraries[3]						
00N79xx[7]	DLT Tape Library	-	16	Rack	Y	N/A	-
	External Tape Enclosures						
03K8756	NetMEDIA Storage Expansion Unit EL[4]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[5]	-	16 LVD	-	N	N	03K8756
	Associated Options						
10K2340	Media Bay Tray and LVD Cable Kit[2,6]	-	16 LVD	Int.	Y	N	-

1. xSeries 330 does not support internal tape drives and does not include an external SCSI connector. An external tape or internal tape with a tape enclosure, supported SCSI adapter and appropriate cable must be selected. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which has an external 0.8-mm VHDCI connector. Select tape drive, enclosure and supported adapter then use Appendix D: Cables-Storage Units-Controllers to select an appropriate external cable.
2.LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL P/N 03K8756 requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit P/N 10K2340 which contains a single two-drop mult-mode terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
3. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
4. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
5. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
6. Media Bay Tray and LVD Cable Kit P/N 10K2340 includes an internal two-drop multi-mode terminated LVD SCSI cable.
7. Where 'xx' represents a country specific power cord code: *Rack versions* - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

xSeries 330 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server[1]

Part Number	Description	Quantity
K441Yxx	xSeries 330 (Pentium III 933/256 MB/0 GB)	1
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD[2]	2
06P4792	Cable Chain Technology Cable Kit[3]	1
31H2Nxx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
28L36xx	Space Saver II Keyboard	1
14RIxxx	APC Smart-UPS 1400RMB	1

1. This example shows a 19” rackable configuration. The rack components are not included.
2. For a total of 36.4 GB of internal storage.
3. A single Cable Chain Technology Cable Kit P/N 06P4792 is required for attachment of one or multiple (up to 42) chained xSeries 330s to a single monitor, mouse and keyboard.

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this is mind, the xSeries 330 was selected to provide an affordable price point for the growing Internet server market with two-way Pentium III processing, 256 MB of system memory (expandable to 4GB), and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used you can add the appropriate adapter.

File and Print Server[1]

Part Number	Description	Quantity
K451Yxx	xSeries 330 (Pentium III 1 GHz/256 MB/0 GB)	1
33L3142	xSeries 128 MB 133 MHz ECC SDRAM RDIMM[2]	1
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD[3]	2
06P4792	Cable Chain Technology Cable Kit[4]	1
31H2Nxx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
28L36xx	Space Saver II Keyboard	1
14RIxxx	APC Smart-UPS 1400RMB	1

1. This example shows a 19” rackable configuration. The rack components are not included.
2. For a total of 384 MB of system memory.
2. For a total of 72.8 GB of internal storage.
4. A single Cable Chain Technology Cable Kit (P/N 06P4792) is required for attachment of one or multiple (up to 42) chained xSeries 330s to a single monitor, mouse and keyboard.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn’t require the high-end performance and fault-tolerance properties of larger servers.

The sample configuration above consists of an xSeries 330 with 384MB of memory and 72.8 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

This configuration also includes a UPS to keep the system protected during power surges and outages.

Application Server[1]

Part Number	Description	Quantity
K431Yxx	xSeries 330 (Pentium III 800/256 MB/0 GB)	1
10K3810	800 MHz Upgrade with 133MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	1
33L3144	xSeries 256 MB 133 MHz ECC SDRAM RDIMM[2]	1
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD[3]	2
06P4792	Cable Chain Technology Cable Kit[4]	1
31H2Nxx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
28L36xx	Space Saver II Keyboard	1
14RIxxx	APC Smart-UPS 1400RMB	1

1. This example shows a 19” rackable configuration. The rack components are not included.
2. For a total of 512 MB of system memory.
2. For a total of 36.4 GB of internal storage.
4. A single Cable Chain Technology Cable Kit P/N 06P4792 is required for attachment of one or multiple (up to 42) chained xSeries 330s to a single monitor, mouse and keyboard.

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the xSeries 330 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 512 MB of system memory (expandable to 4 GB), and availability features such as RAID-protected internal storage and power protection with an APC Smart-UPS.

IBM xSeries 340 and Netfinity 4500R

Part Number*	Withdrawal Date: ddmmyy[7]	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[6]	Bays: (Tot/Av)	Slots: (Tot/Av)
xSeries 340																	
K66RYxx[1]	-	1 GHz	1/2	256	128MB (R)/4GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X-10X	8/6[5]	5/5
Netfinity 5600																	
62RYMxx[1]	24/10/00	667	1/2	256	128MB (R)/4GB	Rack (3U)	1/2	P, H, F	O - Power[3] S- Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X-10X	8/6[5]	5/5
61RYMxx[1]	-	733	1/2	256	128MB (R)/4GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X-10X	8/6[5]	5/5
63RYTxx[1]	-	800	1/2	256	128MB (R)/4GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X-10X	8/6[5]	5/5
64RYTxx[1]	-	866	1/2	256	128MB (R)/4GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X-10X	8/6[5]	5/5
65RYTxx[1]	-	933	1/2	256	128MB (R)/4GB	Rack(3U)	1/2	P, H, F	O - Power[3] S - Fans	Y	10/100	D,U160	4/2[4]	0/218.4 GB[5]	24X-10X	8/6[5]	5/5

xSeries 340 / Netfinity 4500R At-A-Glance

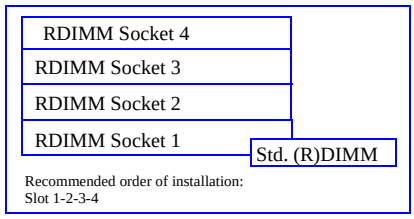
* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance.
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See **Power, Monitors, Accessories** section for supported IBM racks.
2. Intel Pentium III processor with 133 MHz front-side bus.
3. Power supply redundancy requires installation of optional 270 W Hot-Swap Redundant Power Supply P/N 37L6879.
4. xSeries 340 / Netfinity 4500R includes two available removable media bays that can be converted to three slim-line (SL) hot-swap bays with the addition of optional 3-Pack Hot-Swap DASD Upgrade (P/N 33L5050), thus doubling internal hard disk drive storage capacity.
5. Assumes installation of optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050 which converts the two available removable media bays into three slim-line (SL) hot-swap bays.
6. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
7. Not available from IBM after this date. Business Partner inventory may be available.

xSeries 340 / Netfinity 4500R Processor Upgrades

Part Number	Processor Upgrades with 256 KB Cache (Full Speed)	SMP Support[1]	Processor Speed Upgrade[2]
00N7949	Netfinity 667 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	2RY	-
00N7943	Netfinity 733 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	1RY	2RY
10K2338	Netfinity 800 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	3RY	1RY/2RY
19K4630	Netfinity 866 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	4RY	All 1...3RY
19K4631	Netfinity 933 MHz 133 FSB/256 KB Upgrade with Pentium III Processor	5RY	All 1...4RY
19K4640	1 GHz Upgrade with 133 MHz FSB and 256 KB Advanced Transfer Cache Pentium III Processor	6RY	All 1...5RY

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of two processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

xSeries 340 / Netfinity 4500R Memory Configurator



Recommended order of installation:
Slot 1-2-3-4

Part Number	Memory Description[1]
33L3123	128 MB, 133 MHz SDRAM ECC RDIMM II
33L3125	256 MB, 133 MHz SDRAM ECC RDIMM II
33L3127	512 MB, 133 MHz SDRAM ECC RDIMM II
33L3129	1 GB, 133 MHz SDRAM ECC RDIMM II

1. The recommended order of installation is in sequence from Socket 1 to Socket 4. Memory size is not a factor.

Total Memory[1]	Quantity of RDIMMs Added			
128 MB (1 x 128) Models	128 MB (33L3123)	256 MB (33L3125)	512 MB (33L3127)	1 GB (33L3129)
256 MB	1	-	-	-
384 MB	2 or	1	-	-
512 MB	3	-	-	-
640 MB	-	2 or	1	-
896 MB	-	3	-	-
1024 MB	-	4[2]	-	-
1152 MB	-	-	2 or	1
1664 MB	-	-	3	-
2048 MB	-	-	4[2]	-
2176MB	-	-	-	2
3200 MB	-	-	-	3
4096 MB (max)	-	-	-	4[2]

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.
1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory.

xSeries 340 / Netfinity 4500R Internal Hard Disk Drive and External Storage Coinfigurator

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 37L7201)	18.2 GB (P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 37L7204)	18.2 GB (P/N 37L7205)	36.4 GB (P/N 37L7206)
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4[2]	2	1	4[2]	2	1
45.5 GB	5[2]	-	-	5[2]	-	-
54.6 GB	6[2]	3	-	6[2]	3	-
72.8 GB	-	4[2]	2	-	4[2]	2
91 GB	-	5[2]	-	-	5[2]	-
109.2 GB	-	6[2]	3	-	6[2]	3
145.6GB	-	-	4[2]	-	-	4[2]
182 GB	-	-	5[2]	-	-	5[2]
218.4 GB (max.)	-	-	6[2]	-	-	6[2]

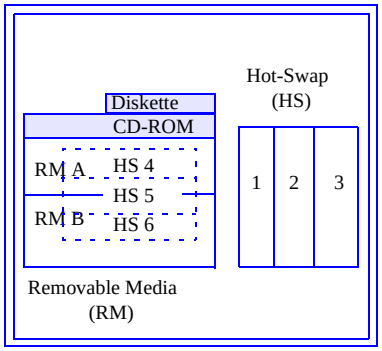
This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2. Requires Netfinity 3-Pack Ultra 160 Hot-Swap Expansion Kit P/N 33L5050.

Bay	Form Factor	Height	Front Access	Usage
-	89 mm (3.5”)	-	Yes	Diskette
-	133 mm (5.25”)	-	Yes	IDE CD-ROM
1...3	HS	SL[1]	Yes	Open
A, B	133 mm (5.25”)	HH[2]	Yes	Open
4...6[3]	HS	SL[1]	Yes	Open

Part Number	Description	RPM	Height	Bays Supported[2]	Max. Qty.
	Ultra160 Hard Disk Drives (HDD)				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...6	6[1]
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...6	6[1]
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...6	6[1]
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...6	6[1]
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...6	6[1]
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...6	6[1]
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1...6	6[1]
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1...6	6[1]
	Associated Options				
33L5050	Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit[2]	-	3 x SL	4...6	-

	External Storage Expansion Units[3]	**Form Factor**
00N6xxx[8]	Netfinity EXP200 Storage Expansion Unit[4, 7]	Rack (3U)
37L0xxx[9]	Netfinity EXP200 350 W Redundant Power Supply[7]	-
19K11xx[10]	EXP300 Storage Expansion Unit[5, 7]	Rack (3U)
00N71xx[11]	FAStT EXP500 Storage Expansion Unit[6, 7]	Rack (3U)
94G7448	Rack Power Cable Type C12 (3.7m)[7]	-

1. Half-High devices are NOT supported.
2 Two half-high (HH) bays can be combined to support a single full-high (FH) device. By installing Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050), bays A and B are transformed into three SL hot-swap bays 4...6.
3. To enable bays 4...6, optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) is required.



1. Netfinity 4500R ships with Bays 1...3 enabled. To enable installation of greater than three HDDS requires Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050.
2. Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050 includes a hot-swap backplane and associated components for two cabling options. The backplane may be cabled directly to the second integrated SCSI channel or be supported by the same SCSI channel as the standard backplane through the use of an included repeater card.
3. Select an optional SCSI controller and then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
4. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and single hot-swap 350W power supply. Optional hot-swap Netfinity EXP200 350W Redundant Power Supply (P/N 37L0xxx) provides redundancy.
5. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies.
6. FAStT EXP500 Storage Expansion Unit (P/N 00N71xx) includes dual hot-swap 350W power supplies.
7. These units do not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order Rack Power Cables according to the number of power supplies.
8. Where ‘xxx’ represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English:- Line Cords/ Publication Country Kits are included throughout.
9. Where ‘xxx’ represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.
10.Where ‘xx’ represents a specific country code: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included throughout.
11. Where ‘xx’ represents a country specific code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English. Country/ Language Line Cords/Publications are included as indicated.

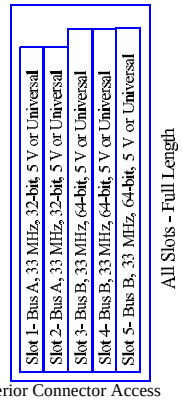
xSeries 340 / Netfinity 4500R Internal SCSI Cabling

The xSeries 340 and Netfinity 4500R contain a DASD backplane supporting three hot-swap, SCA-2 compliant drive bays. The backplane is connected to one of the internal connectors of the integrated Ultra160 SCSI controller through a 16-bit LVD SCSI cable. A single-drop 16-bit SCSI cable is included with the server for attachment from the second internal Ultra160 connector to a removable media bay device. If an LVD attachment is required or more than one media bay device is required, a terminated two-drop 16-bit LVD SCSI cable available in the Netfinity Media Bay Conversion Kit P/N 10K2340 must be ordered. No external SCSI port is included.

If optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050 is installed in the removable media bays, four cabling options are possible. Included with this option is a 16-bit LVD SCSI cable, identical to the one used for attachment of the standard hot-swap backplane, which can be used to attach the optional 3-Pack Ultra160 Hot-Swap backplane directly to the second onboard SCSI connector or that of an optional RAID adapter. Alternatively, a repeater card and cable are included which may be used to link the standard hot-swap backplane and optional hot-swap backplane together while utilising the standard SCSI cable for attachment of the repeater card to one of the onboard SCSI connectors or that of an optional RAID adapter.

xSeries 340 / Netfinity 4500R I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II[2]	Full	32-bit	1...5
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[3]	Full	32/64-bit	1...5
37L6091	ServeRAID-4L Ultra160 SCSI Controller[4]	Full	32/64-bit	1...5
37L6080	ServeRAID-4M Ultra160 SCSI Controller[5]	Full	32/64-bit	1...5
37L6889	ServeRAID-4H Ultra160 SCSI Controller[6]	Full	32/64-bit	1...5
19K4646	PCI Wide Ultra160 SCSI Adapter[16]	Half	32/64-bit	1...5
02K3454	PCI Fast/Wide Ultra SCSI Adapter[7]	Half	32-bit	1...5
	Fibre Storage Controllers and Options[8]			
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...5
19K11xx[21]	FAStT200 Storage Server	-	-	-
19K11xx[22]	FAStT200 HA Storage Server	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-
	Networking[9]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...5
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1...5
	Token Ring			
34L0701	Token-Ring 16/4 PCIAdapter 2 with Wake on LAN[17]	Half	32-bit	1...5
	Communications[10]			
	Systems Management[11]			
36L96xx[20]	Netfinity Advanced System Management PCI Adapter[12]	Full	32-bit	1...5[13]
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[14]	-	-	-
36L9654	Netfinity Adv6nced System Management Token-Ring Connection[15]	-	-	-
	Host Attach			
10L7368	Netfinity ESCON Adapter[18]	Full	32-bit	1...5[19]



Exterior Connector Access

1. xSeries 340 / Netfinity 4500R include a dual-port, dual-channel Ultra160 SCSI controller for internal use only. No standard external port is available. See “Internal SCSI Cabling” for cabling alternatives. Due to Netfinity 4500R’s low profile, some adapters with connectors on the top edge may not have sufficient clearance to attach a cable. Cabling interferences are identified in the footnotes.
2. Netfinity ServeRAID-3L Ultra2 SCSI Adapter II (P/N 19K0564) provides either one internal or one external (0.8-mm VHDCI) LVDS SCSI channel.
3. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086) provides 2 external (0.8-mm VHDCI) LVDS SCSI channels. The internal connector is not accessible due to a cabling interference. Includes 32 MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
4. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
5. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two external 0.8-mm VHDCI Ultra160 connectors.
6. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache. The internal connectors are not accessible due to cabling interference. Four external Ultra160 0.8-mm VHDCI connectors are available.
7. PCI Fast/Wide Ultra SCSI Adapter provides one external 68-pin high density connector. The internal connectors are not accessible due to a cabling interference.
8. See Fibre Array Solutions section for additional configuration information.
9. xSeries 340 / Netfinity 4500R include a full-duplex, 10/100 Mbps Ethernet PCI controller.
10. xSeries 340 / Netfinity 4500R include two USB ports, two serial and one parallel port.
11. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into xSeries 340 / Netfinity 4500R works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter (P/N 36L96xx) and Netfinity Advanced System Management Interconnect Cable Kit (P/N 03K9309) additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
12. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter, which requires a separate power source. Provides an integrated 10/100 Ethernet port and a PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection (P/N 36L9654).
13. A maximum quantity of one is supported.
14. Required for all xSeries and Netfinity Servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1xX...4xX are not supported). Optional Netfinity Advanced System Management PCI Adapter (P/N 36L96xx) includes the contents of this option.Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
15 Contains an IBM Turbo 16/4 Token-Ring PCI card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter (P/N 36L96xx), and a PC Card to 9-pin D-Shell cable which is routed to an available adapter slot opening (reduces available slots by one). The Netfinity Advanced System Management PCI Adapter’s integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together.
16. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
17. The Wake on LAN function of this option is not supported by this server.
18. Provides an ESCON MIC and a DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
19. A maximum of two ESCON adapters (installed in non-adjacent slots) are supported in a single server.
20. Where ‘xx’ represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.
21.Where ‘xx’ represents a country specific code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English. Country/Language - Line Cords/Publications are included as indicated
22.Where ‘xx’ represents a country specific code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English. Country/Language - Line Cords/Publications are included as indicated.

Part Number	Description
Power[1,8]	
37L6879	270 W Hot-Swap Redundant Power Supply[8]
94G7448	Rack Power Cable Type C12 (3.7m)[8]
Uninterruptible Power Supply (UPS)[2]	
14RIxxx[10]	APC Smart-UPS 1400RMB[3]
30RIxxx[10]	APC Smart-UPS 3000RMB[3]
37L6862	APC Smart-UPS 5000RMB[4]
	Monitors[5]
T3347xx[9]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
31H2Nxx[9]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T32N3xx[9]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
T274Axx[9]	G78 Color Monitor 17" (406.4-mm, 16" Viewable Image Size), stealth black[6]
11AG1xx[9]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[7]

1. xSeries 340 / Netfinity 4500R include a single 270 W, hot-swap power supply and a single standard country power cord. Power supply redundancy can be achieved with the addition of optional 270 W Hot-Swap Redundant Supply P/N 37L6879.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. xSeries 340 / Netfinity 4500R use an SVGA controller (S3 Savage4 chipset) with 8 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment P/N 94G7444.
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit II P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
8. Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered for power connection of a rack model to a high voltage UPS or PDU.
9. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
10. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

Part Number	Description
Rack and NetBAY[1,8]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
9306200	Netfinity NetBAY22
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit II
94G7448	Rack Power Cable Type C12 (3.7m)[8]
Keyboard and Mouse[2]	
28L36xx[6]	Space Saver II Keyboard[3, 5]
28L36xx[7]	Preferred Keyboard (stealth black)[4]
28L3675	Sleek 2-Button Stealth Black Mouse

1. xSeries 340 / Netfinity 4500R are housed in a 19" rack mountable drawer and requires one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
2. xSeries 340 / Netfinity 4500R ship without a keyboard or mouse.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
5. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
6. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
7. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
8. The xSeries 340 / Netfinity 4500R ships with a standard country power cord. For connection to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.

xSeries 340 / Netfinity 4500R Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[2]	A, B	16 Ultra2 LVD	89 mm (3.5”) HH or 133 mm (5.25”) HH	Y	N/A	03K8756[1]
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	A, B	16	133 mm (5.25”) HH	N[3]	N/A	03K8756
09N4040	20/40 GB DLT Internal SCSI Tape Drive	A/B	8	133 mm (5.25”) FH	N[3]	Y	03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive[2]	A/B	16 Ultra2 LVD	133 mm (5.25”) FH	N[3]	N/A	03K8756[1]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive[2]	A, B	16 Ultra2 LVD	133 mm (5.25”) HH	N[3]	N/A	03K8756[1]
Tape Autoloaders							
00N7992	120/240GB DDS/4 Tape Autoloader[2]	A/B	16 Ultra2 LVD	133 mm (5.25”) FH	N[3]	N/A	03K8756[1]
External Tape Libraries[4]							
00N79xx[8]	DLT Tape Library	-	16	Rack	Y	N/A	-
External Tape Enclosures							
03K8756	NetMEDIA Storage Expansion Unit EL[5]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[6]	-	16 LVD	-	N	N	03K8756
Associated Options							
10K2340	Media Bay Tray and LVD Cable Kit[1,2,7]	-	16 LVD	Int.	Y	N	-

Note: xSeries 340 / 4500R includes a single drop, 16-bit, single-ended, non-terminated SCSI cable for attachment of a device in Bay A or B to the second integrated Ultra160 SCSI channel or supported adapter. No external SCSI port is available. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) which has an external 0.8-mm VHDCI connector.
1.LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL (P/N 03K8756) requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit (P/N 10K2340) which contains a single two-drop multi-mode terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
2. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, LVD SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340)
3. Termination requires installation of the multi-mode terminated, two-drop, LVD SCSI cable included with optional Media Bay Tray and LVD Cable Kit (P/N 10K2340)
4. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
5. NetMEDIA Storage Expansion Unit EL (P/N 03K8756) is a black 3U, 19” rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25”) bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
6. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
7. Media Bay Tray and LVD Cable Kit (P/N 10K2340) includes an internal two-drop multi-mode terminated LVD SCSI cable.
8. Where ‘xx’ represents a country specific power cord code: *Rack versions* - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

xSeries 340 / Netfinity 4500R Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server

Part Number	Description	Quantity
65RYTxx	Netfinity 4500R 340Pentium III 933 MHz/256 KB L2, 128 MB ECC, OPEN, 24X, PCI (Rack 3U)	1
33L3123	128 MB SDRAM ECC RDIMM II[1]	1
37L6086	Netfinity ServeRAID 3HB Ultra2 SCSI Adapter	1
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD[2]	4
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1
10K2340	Media Bay Tray and LVD Cable Kit	1
31H2Nxx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black	1
14RIxxx	APC Smart-UPS 1400RMB	1
37L6879	270 W Hot-Swap Redundant Power Supply	1
	Industry Standard 19” Rack, EIA-310D, min. depth of 28” (711 mm)	
9306200	Netfinity NetBAY22	1
28L36xx	Space Saver II Keyboard	1
94G6670	Blank Filler Kit	2

1. For a total of 256 MB of system memory.
2. For a total of 27.3 GB of RAID protected hot-swap, hot-spare internal storage.

An internet server is a server that handles all requests from the Internet (intranet or extranet). Usually this type of server has the same characteristics as a file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (Firewall). In the case of an internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does. With this in mind the xSeries 340 was selected to provide an affordable price point for the growing internet server market, 256 MB of system memory (expandable to 4 GB), and availability features such as RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the internet. Usually fast Ethernet routers are used, but if other methods are used, you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

Application Server

Part Number	Description	Quantity
K66RYxx	xSeries 340 Pentium III 1 GHz/256 KB L2, 128 MB ECC, OPEN, 24X, PCI (Rack 3U)	1
19K4630	xSeries1 GHz Upgrade with 133 FSB and 256 KB Advanced Transfer Cache Pentium III Processor	1
33L3125	256 MB 133 MHz SDRAM ECC RDIMM II	1
37L6086	Netfinity ServeRAID 3HB Ultra2 SCSI Adapter	1
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD[2]	3
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1
10K2340	Media Bay Tray and LVD Cable Kit	1
31H2Nxx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black	1
37L6879	Netfinity 270 W Hot-Swap Redundant Power Supply	1
14RIxxx	APC Smart-UPS 1400RMB	1
	Industry Standard 19” Rack, EIA-310D, min. depth of 28” (711 mm)	
9306200	Netfinity NetBAY22	1
28L36xx	Space Saver II Keyboard	1
94G6670	Blank Filler Kit	2

1. For a total of 384 MB of system memory.
2. For a total of 54.6 GB of usable RAID 5 storage.

An application server is designed to handle a high workload while providing application serving requirements for users. With this in mind, the xSeries 340 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 384 MB of system memory (expandable to 4GB),and availability features such as battery-backed cache, RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

IBM Netfinity 1000 Value Model Configurator

Part Number *	Withdrawal Date: ddmmyy[3]	Processor Speed (MHz)	Number of Processors (Std/Max)	L2 ECC Cache (KB)	Memory: std./max. (MB) 100MHz	Form Factor	Power Supply Quantity (Std/Max)	Onboard Ethernet	Storage Controller	Removable Media Bays (Total//	Internal Hard Disk Drive (Std/Max)	CD-ROM (IDE)[2]	Bays: (Total/Avail)	Slots: (Total/Avail)
751YExx	24/10/00	650[1]	1/1	256	64/768	Tower	1/1	10/100	IDE	4/2	10.1/ 30.3GB	40X-17X	6/3	6/6
761YExx	-	700[1]	1/1	256	64/768	Tower	1/1	10/100	IDE	4/2	10.1/ 30.3GB	40X-17X	6/3	6/6

* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance
1. Intel Pentium III processor.
2. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
3. Not available from IBM after this date. Business Partner inventory may be available.

Netfinity 1000 Value Model Processor Upgrades

Processor Upgrade	Part Numbers	Upgrade Support[1]
Netfinity 700MHz/256KB Pentium III Processor Upgrade	10K2165	51Y

1. Requires removal of the standard processor. A maximum of one processor may be installed. Upgrades may require a BIOS update. To obtain the latest FLASH BIOS, access URL http://www.pc.ibm.com/pc/us, select PERSONAL SUPPORT then select IBM SERVER SUPPORT. Choose a machine type then select Downloadable files and choose the category labled “BIOS”.

Netfinity 1000 Value Model Memory Configurator

DIMM Socket
DIMM Socket
DIMM Socket

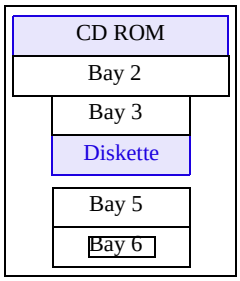
DIMM Description	Part Numbers
64MB 100MHz ECC SDRAM DIMM	01K1130
128MB 100MHz ECC SDRAM DIMM	01K1131
256MB 100MHz ECC SDRAM RDIMM[1]	01K1132

1. P/N 01K1132 is a registered DIMM and is not compatible with P/N 01K1130 or P/N 01K1131. Installation of this RDIMM requires replacement of any standard DIMM.

Total Memory	All Models
64MB	64MB DIMM Standard
128MB	1 x 01K1130
192MB	1 x 01K1131
256MB	1 x 01K1131, 1 x 01K1130
320MB	2 x 01K1131
384MB	3 x 01K1131[1]
512MB	2 x 01K1132[1]
768MB (max)	3 x 01K1132[1]

This table does not represent all possible memory configurations.
1. Replace standard DIMM.

Netfinity 1000 Value Model Internal Hard Disk Drive Configurator



Total Internal Disk Storage[1]	All Models
10.1GB	Standard
20.2GB	1 x 33L4958
30.3GB	2 x 33L4958

1. Total Internal Storage listed is within ± 0.2GB unless otherwise noted.

Bays	Form Factor	Height	Front Access	Usage
1	133 mm (5.25”)	HH	yes	32x IDE CD-ROM
2	133 mm (5.25”)[1]	HH	yes	open
3	89 mm (3.5”)	SL	yes	open
4	89 mm (3.5”)	SL	yes	diskette
5	89 mm (3.5”)	SL[2]	no	open
6	89 mm (3.5”)	SL[2]	no	open

1. A 3.5” conversion kit is standard in Bay 2 for installation of 3.5” devices.
2. Two slim-line bays can be combined to support a single half-high (HH) device.

Part Numbers	Description	RPM	Height	Bays Supported	Max. Qty.
33L4958	10.1GB 7200rpm EIDE HDD[1]	7200	SL	2,3,5,6	3

1. This Hard Disk Drive is the only one supported in the Netfinity 1000 IDE Models.

Internal Cabling

The Netfinity 1000 Value models have an onboard IDE Storage Controller that provides support for up to four internal IDE devices. A two-drop IDE cable is attached to one of the IDE controller connectors and is used for the standard IDE CD-ROM drive and 10.1GB 7200rpm EIDE Hard Disk Drive. A second two-drop IDE cable is shipped with the server to be used for installing a second and third 10.1GB EIDE HDD as desired. This cable attaches to the second connector of the IDE controller.

Netfinity 1000 Value Model I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
02K3454	PCI Fast/Wide Ultra SCSI Adapter[2]	Half	32-bit	1, 2, 3
	Networking[3]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1, 2, 3
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[4]	Half	32-bit	1, 2, 3
34L5201	High speed 100/16/4 Token Ring PCI Management Adapter	Half	32-bit	1, 2, 3
	Communications			
37L14xx	Serial I/O SST8, 16 and 128 port adapters[5]	Half	32-bit	1, 2, 3
	Systems Management[6]			

Slot 1- PCI, 32-bit, Full Length
Slot 2- PCI, 32-bit, Full Length
Slot 3- PCI, 32-bit, Full Length
Slot 4- ISA, Full Length
Slot 5- ISA, Full Length
Slot 6- ISA, Full Length
AGP

1. The Netfinity 1000 IDE models ship with integrated IDE controller and cable for support of up to 3 hard disk drives. Optional SCSI support is limited to Tape Drives only. No SCSI hard disk drives are supported.
2. Supports attachment of internal tape drive only. Includes 16-bit SCSI cable.
3.The Netfinity 1000 IDE models have an integrated 10/100 PCI Ethernet Controller.
4.The Wake on LAN function of this option is not supported by Netfinity Servers.
5. See Appendix E for details on Serial I/O options and configuration limitations.
6. The Netfinity 1000 IDE models provide the following integrated system management features - Vital Product Data (VPD) plus thermal, voltage, and fan sensors.

Netfinity 1000 Value Model Power, Monitors, Accessories

Part Number	Description
	Power[1]
	Uninterruptible Power Supply (UPS)[2]
SUP072Y	APC Smart-UPS 700
SUP102Y	APC Smart-UPS 1000
	Monitors
T3347xx[3]	E51 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black
31H2Nxx[3]	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black
T32N3xx[3]	E74 Color Monitor 17” (403-mm, 15.9” Viewable Image Size), stealth black
T274Axx[3]	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black
11AG1xx[3]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0” Viewable), stealth black

1. The Netfinity 1000 model 42Y includes a 330 W voltage sensing power supply.
2. For runtimes and UPS attributes, see Appendix C: UPS Runtime Estimate.
3. Where ‘xx’ represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.

Netfinity 1000 Value Model Tape Option

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin ConverterIncl.	Ext. Tape Enclosures
09N4042	IBM 10/20GB NS Internal SCSI Tape Drive[1]	2, 3	8	89 mm (3.5”) SL or 133 mm (5.25”) HH	Y	Y	N/A

1. Requires PCI Fast/Wide Ultra SCSI Adapter P/N 02K3454, which includes a SCSI cable.

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

Netfinity 1000 Value Model Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Workgroup Internet Server

Part Number	Description	Quantity
761YExx	IBM Netfinity 1000 IDE Pentium III 700/256KB L2, 64MB ECC, 10.1GB	1
01K1130	64MB 100MHz ECC SDRAM DIMM[1]	1
33L4958	10.1GB 7200rpm EIDE HDD	1
02K3454	PCI Fast/Wide Ultra SCSI Adapter[2]	1
09N4042	IBM 10/20GB NS Internal SCSI Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (13.8” Viewable Image Size), stealth-black	1
SUP102Y	APC Smart-UPS 1000	1

1. For a total of 128MB of system memory.
2. Includes a 16-bit SCSI Cable

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an Internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (Firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider(ISP), instead of many clients like a file server does.
With this in mind, the IBM Netfinity 1000 (IDE) was selected to provide an affordable price point for the growing Internet server market with Pentium III processing, 128MB of system memory (expandable to 768MB), integrated 100/10 Ethernet controller, high-performance storage, and power protection with an APC Smart-UPS.
The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File & Print Server

Part Number	Description	Quantity
761YExx	IBM Netfinity 1000 IDE Pentium III 700/256KB L2, 64MB ECC, 10.1GB	1
01K1130	64MB 100MHz ECC SDRAM DIMM[1]	1
02K3454	PCI Fast/Wide Ultra SCSI Adapter[2]	1
09N4042	IBM 10/20GB NS Internal SCSI Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (13.8” Viewable Image Size), stealth-black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 128MB of system memory.
2. Includes a 16-bit SCSI Cable

A small business or departmental server is usually required to perform all typical server functions while servicing up to 50 users in a normal workgroup computing environment, but doesn’t require the high-end performance and fault tolerance properties of larger servers. The sample configuration above consists of an IBM Netfinity 1000 IDE model with 128MB of memory and 10.1GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional internal storage expansion still available. Demanding network traffic is effectively handled by the standard 100Mbps Ethernet connection. This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected from power surges and outages.

IBM Netfinity 3000 Configurator

Part Number*	Withdrawal Date: ddmmyy[5]	Processor Speed (MHz)	Number of Processors (Std/Max)	L2 ECC Cache. (KB)	Memory: std./max. (MB) 100MHz	Form Factor	Power Supply Quantity (Std/Max)	Onboard Ethernet (Mbps)	SCSI Controller (Ultra, Ultra2, Raid, LVD)	Removable Media Bays (Total//	Internal Hard Disk Drive (Std/Max)	CD-ROM (IDE)[1]	Bays: (Total/Avail)	Slots: (T/A)
761UExx	24/10/00	550[3]	1/1	512	64/768	Tower	1/1	10/100	U	4/2	9.1/145.6 GB[2]	40X-17X	6/3	6/5
770UExx	29/12/00	600[3]	1/1	512	64/768	Tower	1/1	10/100	U	4/2	0/145.6 GB	40X-17X	6/4	6/5
771UExx	29/12/00	600[3]	1/1	512	64/768	Tower	1/1	10/100	U	4/2	9.1/145.6 GB[2]	40X-17X	6/3	6/5
780UExx	24/10/00	650[4]	1/1	256	64/768	Tower	1/1	10/100	U2	4/2	0/145.6 GB	40X-17X	6/4	6/5
781UExx	24/10/00	650[4]	1/1	256	128/768	Tower	1/1	10/100	U2	4/2	9.1/145.6 GB[2]	40X-17X	6/3	6/5
790UExx	-	700[4]	1/1	256	64/768	Tower	1/1	10/100	U2	4/2	0/145.6 GB	40X-17X	6/4	6/5
791UExx	-	700[4]	1/1	256	128/768	Tower	1/1	10/100	U2	4/2	9.1/145.6 GB[2]	40X-17X	6/3	6/5

* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance
1. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
2. Standard Hard Disk Drives (HDD) are 7200 RPM. Maximum internal capacities assume replacement of standard hard disk drives with the largest supported IBM hard disk drives.
3. Intel Pentium III processor.
4. Intel Pentium III processor with advanced transfer (full speed) L2 cache.
5. Not available from IBM after this date. Business Partner inventory may be available.

Netfinity 3000 Processor Upgrades

Processor Upgrades	Part Numbers	Upgrade Support[1]
Netfinity 600 MHz/512 KB Upgrade with Pentium III Processor	33L5106	All 71xxxxx to 76xxxxx
Netfinity 700 MHz/256 KB Upgrade with Pentium III Processor[2]	10K2165	All 8xU

1. Requires removal of the standard processor. A maximum of one processor may be installed. Upgrades may require a BIOS update. To obtain the latest FLASH BIOS, access URL http://www.pc.ibm.com/europe/netfinity.html, then select SUPPORT. Choose a machine type then select Downloadable files and choose the category labled “BIOS”..
2. Cannot be used to upgrade models 71xxxxx through 77xxxxx.

Netfinity 3000 Memory Configurator

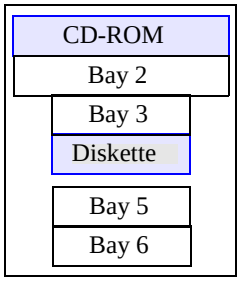
DIMM Socket
DIMM Socket
DIMM Socket

DIMM Description	Part Numbers
64MB 100MHz ECC SDRAM DIMM	01K1130
128MB 100MHz ECC SDRAM DIMM	01K1131
256MB 100MHz ECC SDRAM RDIMM[1]	01K1132[1]

Total Memory	64MB Models	128MB Models
64MB	64MB DIMM Standard	-
128MB	1 x 01K1130	128MB DIMM Standard
192MB	1 x 01K1131	1 x 01K1130
256MB	1 x 01K1131, 1 x 01K1130	1 x 01K1131
320MB	2 x 01K1131	1 x 01K1131, 1 x 01K1130
384MB	3 x 01K1131[2]	2 x 01K1131
512MB	2 x 01K1132[2]	2 x 01K1132[2]
768MB (max)	3 x 01K1132[2]	3 x 01K1132[2]

This table does not represent all possible memory configurations.
1. 256MB RDIMM P/N 01K1132 is a Registered DIMM and is not compatible with P/N 01K1130 or P/N 01K1131. Installation of this RDIMM requires replacement of any standard DIMM.
2. Replace standard DIMM.

Netfinity 3000 Internal Hard Disk Drive Configurator



Open Bay Examples[2]			
Total Internal Storage[1]	**7200RPM Hard Disk Drives (HDDs)**		
	9.1 GB (P/N 00N8204)	**18.2 GB (P/N 00N8205)**	**36.4 GB (P/N 00N8206)**
9.1 GB	Note: 9.1GB disk is standard in models 7x1UExx	-	-
18.2 GB	2	1	-
27.3 GB	3	-	-
36.4 GB	4	2	1
45.5 GB	-	-	-
54.6 GB	-	3	-
72.8 GB	-	4	2
91 GB	-	-	-
109.2 GB	-	-	3
145.6 GB (max)	-	-	4

This table does not represent all possible hard drive configurations.
1. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2. Select a total storage row and then select the quantity of HDDs from a column corresponding to the appropriate hard disk drive. When configuring models which include a single 9.1 GB HDD, use the 9.1 GB column and order one less HDD than the table indicates.

Bay	Form Factor	Height	Front Access	Usage
1	133 mm (5.25")	HH	yes	IDE CD-ROM
2	133 mm (5.25")[1]	HH	yes	open
3	89 mm (3.5")	SL	yes	open
4	89mm (3.5")	SL	yes	diskette
5	89mm (3.5")	SL[2]	no	HDD on drive models
6	89 mm (3.5")	SL[2]	no	open

1. A 3.5" conversion kit is standard in Bay 2 for installation of 3.5" hard disk drives.
2. Two slim-line bays can be combined to support a single half-high (HH) device.

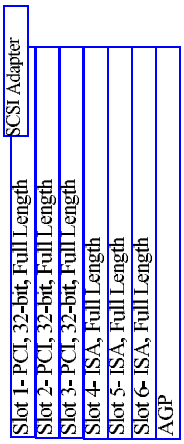
Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
Ultra160 Hard Disk Drives (HDD)[1]					
00N8204	9.1GB Ultra160 SCSI HDD	7200	SL	2,3,5,6	4
00N8205	18.2GB Ultra160 SCSI HDD	7200	SL	2,3,5,6	4
00N8206	36.4GB Ultra160 SCSI HDD	7200	SL	2,3,5,6	4
External Storage Expansion Units[2]		**Form Factor**			
00N6xxx[4]	EXP200 Storage Expansion Unit[3]	Rack (3U)			
37L5857	EXP200 Rack-to-Tower Conversion Kit[3]	-			
37L0xxx[5]	EXP200 350 W Redundant Power Supply	-			

1. Netfinity 3000 models P/N 771UExx and earlier contain an Ultra SCSI controller and cable which limits Ultra2 and Ultra160 HDDs to Ultra bus speeds. Netfinity 3000 models P/N 780UExx and later contain an Ultra2 SCSI controller which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to see Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
3. EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply and standard country power cord. Optional hot-swap EXP200 350W Redundant Power Supply P/N 37L0xxx includes an additional standard country power cord. To convert an EXP200 to match the system's tower form factor, EXP200 Rack-to-Tower Conversion Kit P/N 37L5857 is required.
4. Where 'xxx' represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English - Line Cords/ Publication Country Kits are included throughout.
5. Where 'xxx' represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.

Internal SCSI Cabling

Netfinity 3000 models 71xxxxx to 77xxxxx have a PCI Fast/Wide Ultra SCSI Adapter while models 78xxxxx and up have a PCI Wide Ultra2 SCSI Adapter. All models support up to four internal SCSI devices through the 16-bit internal connector or 15 external SCSI devices through the 16-bit external 68-pin High Density connector; however, when internal SCSI devices are installed to the internal connector, only one SCSI device can be supported from the external connector. All models are cabled internally with a four-drop, 16-bit wide SCSI cable (models 78xxxxx and up have an Ultra2 SCSI cable), with a built-in active terminator at one end. The other end is attached to the internal 68-pin single-ended connector of the SCSI adapter. On the standard disk drive models, the hard disk drive (HDD) is attached to the cable connector closest to the active terminator. On open bay models the first disk drive installed should be attached in the same manner. In the event the standard four drop cable is attached to a RAID controller and a dedicated removable media attachment to the onboard controller is required, an optional, terminated, 16-bit cable is available (Netfinity Two-Drop Internal SCSI Cable P/N 36L9636). This is not an Ultra2 cable, therefore attached devices will operate at Ultra (or slower) speeds. If connecting narrow devices to this cable, additional 68-pin to 50-pin converters (P/N 32G3925) must be ordered. Some narrow devices include a converter in their ship group.

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
01K7364	Netfinity ServeRAID-3L Ultra2 SCSI Adapter[2]	Full	32-bit	3
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[3]	Full	32/64-bit	3
19K4646	PCI Wide Ultra160 SCSI Adapter[8]	Half	32/64-bit	1, 2, 3
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1, 2, 3
	Networking[4]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1, 2, 3
09N9901	10/100 Etherlink Server Adapter by 3Com	Half	32-bit	1, 2, 3
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1, 2, 3
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[5]	Half	32-bit	1, 2, 3
34L5001	16/4 Token-Ring PCI Management Adapter	Half	32-bit	1, 2, 3
34L5201	High speed 100/16/4 Token Ring PCI Management Adapter	Half	32-bit	1, 2, 3
	Communications			
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[6]	Half	32-bit	1, 2, 3
	Systems Management[7]			



1. Netfinity 3000 models P/N 771UExx and earlier contain a single Fast/Wide Ultra SCSI Adapter. Netfinity 3000 models P/N 780UExx and later contain a PCI Wide Ultra2 SCSI controller.
2. Netfinity ServeRAID-3L Ultra2 SCSI Adapter P/N 01K7364 provides either one internal or one external LVDS SCSI channel.
3. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter P/N 37L6086 provides one internal and 2 external (0.8mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8mm VHDCI) providing a total of 3 external LVDS SCSI channels. Includes 32MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
4. Netfinity 3000 has an integrated 10/100 PCI Ethernet Controller.
5. The Wake on LAN function of this option is not supported by Netfinity Servers.
6. See Appendix E for details on Serial I/O options and configuration limitations.
7. Netfinity 3000 provides the following integrated system management features - Vital Product Data (VPD) plus thermal, voltage, and fan sensors. For additional functions, optional PC Server Advanced Systems Management (P/N 94G7578) may be utilised. To enable the adapter's Automated Restart and Alerting as well as Remote Power On/Off features, Advanced Systems Management Power Unit (P/N 94G5571) is required.
8. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.

Netfinity 3000 Power, Monitors, Accessories

Part Number	Description
	Power[1]
	Uninterruptible Power Supply (UPS)[2]
SUP072Y	APC Smart-UPS 700
SUP102Y	APC Smart-UPS 1000
	Monitors
T3347xx[3]	E51 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black
31H2Nxx[3]	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black
T32N3xx[3]	E74 Color Monitor 17” (403-mm, 15.9” Viewable Image Size), stealth black
T274Axx[3]	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black
11AG1xx[3]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0” Viewable), stealth black

1.Netfinity 3000 includes a 330 W voltage sensing power supply.
2. For runtimes and UPS attributes, see Appendix C: UPS Runtime Estimate.
3. Where ‘xx’ represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.

Netfinity 3000 Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin ConverterIncl.	Ext. Tape Enclosures[1]
09N4041	12/24GB DDS/3 4mm Internal SCSI Tape Drive[2,4]	2	8	89 mm (3.5”) HH or 133 mm (5.25”) HH	Y	Y	10L7440
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[3,5]	2	16 Ultra2 LVD	89 mm (3.5”) HH or 133 mm (5.25”) HH	Y	N/A	10L7440
09N4042	10/20GB NS Internal SCSI Tape Drive[2,4]	2, 3	8	89 mm (3.5”) SL or 133 mm (5.25”) HH	Y	Y	10L7440
09N4040	20/40GB DLT Internal SCSI Tape Drive	N/A	8	133 mm (5.25”) FH	N	Y	03K8705[9]
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[6]	-	8/16	Desktop	N	N	-
03K8705	DLT External SCSI Enclosure[7]	-	16	Desktop	N	N	-
	Associated Options						
10K2340	Media Bay Tray and LVD Cable Kit[4,8]	-	16 LVD/SE	Internal	Y	N	-
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	External	Y	N	10L7440, 03K8705

Note: Models P/N 780UExx and above include an Ultra2 SCSI controller with a four-drop multi-mode terminated LVD SCSI cable. Single-Ended devices attached to this cable will limit the entire SCSI bus to single-ended performance. Models P/N 771UExx and below include an Ultra SCSI controller with a four-drop,16-bit single-ended terminated SCSI cable. Support of LVD devices attached to this cable limits the LVD device to a maximum of Ultra SCSI bus speeds. All tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which includes a five-drop multi-mode LVD SCSI cable and an external 0.8-mm VHDCI connector.

1. To determine external cable requirements, note the tape drive’s SCSI interface, the appropriate SCSI controller from the system configurator section, and the desired enclosure, and then refer to Appendix D: Cables - Storage Units - Controllers.
2. This single-ended device will limit the SCSI bus of Models P/N 780UExx and above to Ultra SCSI speeds. To provide a dedicated tape SCSI bus, install PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which includes a five-drop multi-mode LVD SCSI cable.
3. Models P/N 771UExx and below will support LVD tape drives attached to the standard cable, however, bus speeds will be restricted to Ultra SCSI or below. For LVD support, optional PCI Wide Ultra160 SCSI Adapter P/N 19K4646 may be installed (includes required terminated LVD cable).
4. For RAID configurations, where the standard SCSI cable is attached to a RAID adapter, the two-drop multi-mode terminated LVD SCSI cable included with Media BayTray and LVD Cable Kit P/N 10K2340 is required, for attachment of the tape drive to the standard controller.
5. For RAID configurations, where the standard SCSI cable is attached to a RAID adapter, the two-drop multi-mode terminated LVD SCSI cable included with Media BayTray and LVD Cable Kit P/N 10K2340 is required, for attachment of the tape drive to the standard controller. For LVD support, optional PCI Wide Ultra160 SCSI Adapter P/N 19K4646 may be installed (includes required terminated LVD cable).
6. Provides a black desktop 133-mm (5.25”) half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
7. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
8. Media Bay Tray and LVD Cable Kit P/N 10K2340 includes an internal two-drop multi-mode terminated LVD SCSI cable.
9. Requires 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.

NOTE: Additional tape drive information can be found in Appendix A: Tape Drive Attributes.

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

Netfinity 3000 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Workgroup Internet Server

Part Number	Description	Quantity
791UExx	IBM Netfinity 3000 Pentium III 700/256KB L2, 128MB ECC, 9.1GB	1
00N8204	IBM 9.1GB Wide Ultra160 SCSI HDD	2
09N4042	IBM 10/20GB NS Internal SCSI Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (13.8” Viewable Image Size), stealth black	1
SUP102Y	APC Smart-UPS 1000	1

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an Internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (Firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider(ISP), instead of many clients like a file server does.

With this in mind, the IBM Netfinity 3000 was selected to provide an affordable price point for the growing Internet server market with Pentium III processing, 128MB of system memory (expandable to 768MB), integrated 100/10 ethernet controller, high-performance storage, and power protection with an APC Smart-UPS. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File & Print Server

Part Number	Description	Quantity
791UExx	IBM Netfinity 3000 Pentium III 700/256KB L2, 128MB ECC, 9.1GB	1
00N8204	IBM 9.1GB Wide Ultra160 SCSI HDD	1
09N4042	IBM 10/20GB NS Internal SCSI Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

A small business or departmental server is usually required to perform all typical server functions while servicing up to 50 users in a normal workgroup computing environment, but doesn’t require the high-end performance and fault tolerance properties of larger servers. The sample configuration above consists of an IBM Netfinity 3000 with 128MB of memory and 18.2GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional internal storage expansion still available. Demanding network traffic is effectively handled by the standard 100Mbps Ethernet connection. This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected from power surges and outages.

IBM Netfinity 3500 M20 Configurator

Part Number*	Withdrawal Date: ddmmyy[4]	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Onboard Ethernet (Mbps	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[1]	Bays: (Tot/Av)	Slots: (Tot/Av)
721YMxx	24/10/00	667	1/2	256	128MB(R)/2GB	Tower	1/1	10/100	U160	4/2	0/145.6GB	40X-17X	7/5	5/5
722YMxx	24/10/00	667	1/2	256	128MB(R)/2GB	Tower	1/1	10/100	U160	4/2	9.1/145.6GB[3]	40X-17X	7/4	5/5
731YMxx	-	733	1/2	256	128MB(R)/2GB	Tower	1/1	10/100	U160	4/2	0/145.6GB	40X-17X	7/5	5/5
732YMxx	-	733	1/2	256	128MB(R)/2GB	Tower	1/1	10/100	U160	4/2	9.1/145.6GB[3]	40X-17X	7/4	5/5
741YMxx	-	800	1/2	256	128MB(R)/2GB	Tower	1/1	10/100	U160	4/2	0/145.6GB	40X-17X	7/5	5/5
742YMxx	-	800	1/2	256	128MB(R)/2GB	Tower	1/1	10/100	U160	4/2	9.1/145.6GB[3]	40X-17X	7/4	5/5

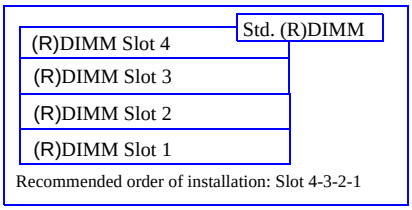
* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance
1. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
2. Intel Pentium III processor with 133 MHz front-side bus (FSB).
3. Standard Hard Disk Drives (HDD) are Ultra2 7200 RPM. Maximum internal capacities assume replacement of standard hard disk drives with the largest supported IBM hard disk drives.
4. Not available from IBM after this date. Business Partner inventory may be available.

Netfinity 3500 M20 Processor Upgrades

Part Number	Processor Upgrades with Full Speed Cache	SMP Support[1]	Processor Speed Upgrade[2]
10K3804	Netfinity 667 MHz/256 KB Upgrade with 133 MHz FSB Pentium III Processor	2xY	-
10K3805	Netfinity 733 MHz/256 KB Upgrade with 133 MHz FSB Pentium III Processor	3xY	2xY
10K3817	Netfinity 800 MHz/256 KB Upgrade with 133 MHz FSB Pentium III Processor	4xY	All 2...3xY

1. One additional processor may be installed, providing a maximum of two. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of two processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

Netfinity 3500 M20 Memory Configurator



Recommended order of installation: Slot 4-3-2-1

Part Number	Memory Description[1]
33L3123	Netfinity 128 MB, 133 MHz SDRAM ECC RDIMM II
33L3125	Netfinity 256 MB, 133 MHz SDRAM ECC RDIMM II
33L3127	Netfinity 512 MB, 133 MHz SDRAM ECC RDIMM II

1. The recommended order of installation is in declining sequence from Slot 4 to Slot 1. Memory size is not a factor.

Total Memory[1]	Quantity of RDIMMs Added		
128 MB (1 x 128) Models	128 MB (P/N 33L3123)	256 MB (P/N 33L3125)	512 MB (P/N 33L3127)
256 MB	1	-	-
384 MB	2 or	1	-
512 MB	3	-	-
640 MB	-	2 or	1
896	-	3	-
1152 MB	-	-	2
1664 MB	-	-	3
2048 MB	-	-	4[2]

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. Requires removal of standard memory.

Netfinity 3500 M20 Internal Hard Disk Drive Configurator

Open Bay Examples[2]						
Total Int. Storage[1]	**7200RPM Hard Disk Drives (HDDs)**			**10,000RPM Hard Disk Drives (HDDs)**		
	9.1 GB (P/N 00N8204)	**18.2 GB (P/N 00N8205)**	**36.4 GB (P/N 00N8206)**	**9.1 GB (P/N 00N8207)**	**18.2 GB (P/N 00N8208)**	**36.4 GB (P/N 00N8209)**
9.1 GB	Note: 9.1GB disk is standard in models 7x2YMxx	-	-	1	-	-
18.2 GB	2 or	1	-	2 or	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4 or	2 or	1	4 or	2 or	1
45.5 GB	-	-	-	-	-	-
54.6 GB	-	3	-	-	3	-
72.8 GB	-	4 or	2	-	4 or	2
91 GB	-	-	-	-	-	-
109.2 GB	-	-	3	-	-	3
145.6 GB (max)	-	-	4	-	-	4

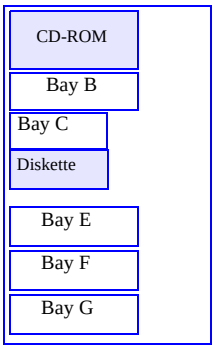
This table does not represent all possible hard drive configurations.
1. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2. Select a total storage row and then select the quantity of HDDs from a column corresponding to the appropriate hard disk drive. When configuring disk drive models P/N 7x2YMxx, which include a single 9.1GB 7200 RPM HDD, use the 9.1 GB column and order one less HDD than the table indicates.

Bay	Form Factor	Height	Front Access	Usage
A	133 mm (5.25”)	HH	Yes	IDE CD-ROM
B[1]	133 mm (5.25”)	HH	Yes	Open[1]
C	89 mm (3.5”)	SL	Yes	Open
D	89 mm (3.5”)	SL	Yes	Diskette
E...F	89 mm (3.5”)	SL	No	Open
G	89 mm (3.5”)	SL	No	HDD on Drive Models

1. This bay does not support the installation of hard disk drives.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
Ultra160 Hard Disk Drives (HDD)					
00N8204	9.1GB 7200 rpm Ultra160 SCSI HDD	7200	SL	C,E,F,G	4
00N8205	18.2GB 7200 rpm Ultra160 SCSI HDD	7200	SL	C,E,F,G	4
00N8206	36.4GB 7200 rpm Ultra160 SCSI HDD	7200	SL	C,E,F,G	4
00N8207	9.1GB 10,000 rpm Ultra160 SCSI HDD	10000	SL	C,E,F,G	4
00N8208	18.2GB 10,000 rpm Ultra160 SCSI HDD	10000	SL	C,E,F,G	4
00N8209	36.4GB 10,000 rpm Ultra160 SCSI HDD	10000	SL	C,E,F,G	4

	External Storage Expansion Units[1]	**Form Factor**
00N6xxx[4]	EXP200 Storage Expansion Unit[2]	Rack (3U)
37L5857	EXP200 Rack-to-Tower Conversion Kit	-
37L0xxx[5]	EXP200 350 W Redundant Power Supply	-
19K11xx[6]	EXP300 Storage Expansion Unit[3]	Rack (3U)



09N7296	EXP300 Rack-to-Tower Conversion Kit	-

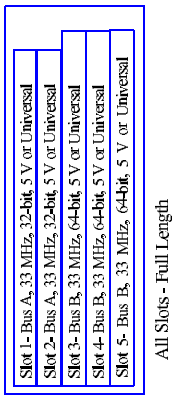
1. No external SCSI port is available. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
2. EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply and standard country power cord. Optional hot-swap EXP200 350W Redundant Power Supply (P/N 37L0xxx) includes an additional standard country power cord. To convert an EXP200 to match the 3500 M20's form factor, EXP200 Rack-to-Tower Conversion Kit P/N 37L5857 is required.
3. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies, each with its own standard country power cord. To convert an EXP300 to match the 3500 M20's form factor, EXP300 Rack-to-Tower Conversion Kit P/N 09N7296 is required.
4. Where 'xxx' represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English - Line Cords/ Publication Country Kits are included throughout.
5. Where 'xxx' represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.
6.Where 'xx' represents a specific country code: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included throughout.

Internal SCSI Cabling

Netfinity 3500 M20 systems are cabled internally with a five-drop, 16-bit wide LVD SCSI cable with a built-in active terminator at one end of the cable. The other end of the cable is attached to the internal connector of the integrated Wide Ultra160 SCSI controller. For RAID configurations, the cable can be moved from the onboard to the optional RAID controller. A tape drive can then be cabled directly to the onboard or other supported adapter with the terminated, two-drop, 16-bit, LVD SCSI cable available in the Netfinity Media Bay Conversion Kit P/N 10K2340. No external SCSI port is included.

Netfinity 3500 M20 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported
	Storage Controllers[1]			
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II[2]	Full	32-bit	1...5
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[3]	Full	32/64-bit	1...5
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1...5
37L6091	ServeRAID-4L Ultra160 SCSI Controller[4]	Full	32/64-bit	1...5[6]
37L6080	ServeRAID-4M Ultra160 SCSI Controller[5]	Full	32/64-bit	1...5[6]
19K4646	PCI Wide Ultra160 SCSI Adapter[9]	Half	32/64-bit	1...5
	Networking[7]			
	Ethernet			
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...5
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...5
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1...5
	Token Ring			
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN	Half	32-bit	1,,,5
	Communications[8]			



Exterior Connector Access

1. Netfinity 3500 M20 includes a single channel Ultra160 SCSI controller for internal use only. No standard external port is available. See "Internal SCSI Cabling" for cabling alternatives.
2. Netfinity ServeRAID-3L Ultra2 SCSI Adapter II P/N 19K0564 provides either one internal or one external (0.8-mm VHDCI) LVDS SCSI channel.
3. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter P/N 37L6086 provides one internal and 2 external (0.8-mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8-mm VHDCI connector) providing a total of 3 external LVDS SCSI channels. Includes 32 MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
4. ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
5. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilised). External connectors are 0.8-mm VHDCI.
6. ServeRAID-4L P/N 37L6091 and -4M P/N37L6080 are not supported in slots 1 or 2 if more than one RAID adapter is to be installed or more than one logical drive is to be attached to the adapter.
7. Netfinity 3500 M20 includes a full-duplex, 10/100 Mbps Ethernet PCI controller.
8. Netfinity 3500 M20 includes two USB ports, one serial and one parallel port.
9. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.

Netfinity 3500 M20 Power, Monitors, Accessories

Part Number	Description
Power[1]	
Uninterruptible Power Supply (UPS)[2]	
SUP072Y	APC Smart-UPS 700
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
Monitors[3]	
T3347xx[4]	E51 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black
31H2Nxx[4]	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black
T32N3xx[4]	E74 Color Monitor 17” (403-mm, 15.9” Viewable Image Size), stealth black
T274Axx[4]	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black
11AG1xx[4]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0” Viewable), stealth black

1. Netfinity 3500 M20 includes a 330 W voltage sensing power supply.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Netfinity 3500 M20 uses an SVGA controller (S3 Savage4 chipset) with 8 MB of video memory.
4. Where ‘xx’ represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.

Netfinity 3500 M20 Tape Options

Part Number	Tape Drives	Bays Supported[2]	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures[1]
09N4041	12/24 GB DDS/3 4-mm Internal SCSI Tape Drive[2,3]	B	8	89 mm (3.5”) HH or 133 mm (5.25”) HH	Y	Y	10L7440
09N4042	10/20 GB NS Internal SCSI Tape Drive[2,3]	B, C	8	89 mm (3.5”) SL or 133 mm (5.25”) HH	Y	Y	10L7440
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[4]	B	16 Ultra2 LVD	89 mm (3.5”) HH or 133 mm (5.25”) HH	Y	N/A	10L7440
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[5]	-	8/16	Desktop	N	N	-
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	External	Y	N	10L7440
10K2340	Media Bay Tray and LVD Cable Kit[3,4,6]	-	16 LVD	Internal	Y	N	-

Note:All models include an Ultra160 SCSI controller with a five-drop multi-mode terminated LVD SCSI cable. Single-Ended devices attached to this cable will limit the entire SCSI bus to single-ended performance. All tape drives and external tape enclosures are supported by PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which includes a five-drop multi-mode terminated LVD SCSI cable and an external 0.8-mm VHDCI connector.

1. To determine cable requirements, note the tape drive’s SCSI interface, the appropriate SCSI controller from the system configurator section, and the desired enclosure, then refer to Appendix D: Cables - Storage Units - Controllers.
2.This single-ended device will limit the SCSI bus to which it is attached to Ultra SCSI speeds. To provide a dedicated tape SCSI bus, install PCI Wide ultra160 SCSI Adapter P/N 19K4646 which includes a five-drop multi-mode LVD SCSI cable.
3. For RAID configurations, where the standard SCSI cable is attached to a RAID adapter, the two-drop multi-mode terminated LVD SCSI cable included with Media BayTray and LVD Cable Kit P/N 10K2340 is required, for attachment of the tape drive to the standard SCSI controller.
4. For RAID configurations, where the standard SCSI cable is attached to a RAID adapter, the two-drop multi-mode terminated LVD SCSI cable included with Media BayTray and LVD Cable Kit P/N 10K2340 is required, for attachment of the tape drive to the standard SCSI controller. For LVD support, optional PCI Wide Ultra160 SCSI Adapter P/N 19K4646 may be installed (includes required terminated LVD cable).
5. Provides a black desktop 133 mm (5.25”) half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
6. Media Bay Tray and LVD Cable Kit P/N 10K2340 includes an internal two-drop multi-mode terminated LVD SCSI cable.

Note: Additional tape information can be found in Appendix A: Tape Drive Attributes.

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

Netfinity 3500 M20 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server

Part Number	Description	Quantity
732YMxx	Netfinity 3500 M20 Pentium III 733 MHz/128 MB/9.1 GB	1
33L3123	128 MB, 133 MHz SDRAM ECC RDIMM II[1]	1
00N8204	9.1 GB Wide Ultra160 SCSI HDD[2]	2
09N4042	10/20 GB NS Internal SCSI Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 256 MB of system memory.
2. For a total of 27.3 GB of internal storage.

An Internet server is a server that handles all requests from the Internet (Intranet or Extranet). Usually, this type of server has the same characteristics as a normal file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this is mind, the IBM Netfinity 3500 M20 was selected to provide an affordable price point for the growing Internet server market with up to two-way Pentium III processing capability, 256 MB of system memory (expandable to 1 GB), and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

File and Print Server

Part Number	Description	Quantity
731YMxx	Netfinity 3500 M20 Pentium III 733/128 MB/0 GB	1
33L3123	128 MB, 133 MHz SDRAM ECC RDIMM II[1]	1
00N8208	18.2 GB 10,000 RPM Ultra160 SCSI HDD[2]	3
00N7991	20/40GB DDS/4 4mm Internal SCSI Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 256 MB of system memory.
2. For a total of 54.6 GB of internal storage.

A small business or departmental server is usually required to perform all typical server functions while servicing up to 100 users in a normal workgroup computing environment, but doesn’t require the high-end performance and fault-tolerance properties of larger servers.

The sample configuration above consists of an IBM Netfinity 3500 M20 with 256 MB of memory and 54.6 GB of hard disk space. It has enough processor power and memory to run most current network operating systems comfortably and enough hard disk drive space to store a significant amount of data with additional external storage expansion still available. Demanding network traffic is effectively handled by the standard 100 Mbps Ethernet connection.

This configuration also includes a tape backup unit, monitor, and a UPS to keep the system protected during power surges and outages.

Application Server

Part Number	Description	Quantity
741YMxx	Netfinity 3500 M20 Pentium III 800 MHz/128 MB/0 GB	1
10K3817	Netfinity 800 MHz/256 KB Upgrade with 133 MHz FSB Pentium III Processor	1
33L3125	256 MB, 133 MHz SDRAM ECC RDIMM II[1]	1
37L6091	Netfinity ServeRAID-4L Ultra160 SCSI Adapter	1
10K2340	Media Bay Tray and LVD Cable Kit[2]	1
00N8207	9.1 GB 10,000 RPM Ultra 160 SCSI HDD[3]	3
09N4042	10/20 GB NS Internal SCSI Tape Drive	1
31H2Nxx	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black	1
SUP072Y	APC Smart-UPS 700	1

1. For a total of 384 MB of system memory.
2. Includes a cable for dedicated attachment of the tape drive to the standard controller.
3. For a total of 27.3 GB of internal storage.

An application server differs from a file and print server in that it has a higher workload, in providing application serving requirements for users. With this in mind, the IBM Netfinity 3500 M20 was selected to provide an affordable price point for an application server, with two-way Pentium III processing, 384 MB of system memory (expandable to 2 GB), and availability features such as RAID-protected internal storage and power protection with an APC Smart-UPS.

IBM Netfinity 4000R Configurator

Part Number*	Withdrawal Date: ddmmyy[6]	Processor Speed (MHz)	Number of Processors (Std/Max)[1]	L2 ECC Cache. (KB)	Memory: std./max. RDIMM[1]	Form Factor	Power Supply Quantity (Std/Max)	Onboard Ethernet (Mbps)	SCSI Adapter (Ultra, Ultra2, Raid, LVD)	Removable Media Bays (Total//	Internal Hard Disk Storage (Std/Max)[1]	CD-ROM (IDE)[3]	Bays: (Total/Avail)[1]	Slots: (T/A)[1]
865341Y	24/10/00	2 x 750[2]	2/2	256	512MB/2GB	Rack(1U)	1/1	2 x 10/100	U	1/0	18.2/36.4[4] GB	24X-10X	3/0	2/1
865344Y[5]	24/10/00	2 x 750[2]	2/2	256	512MB/2GB	Rack(1U)	1/1	2 x 10/100	U	1/0	36.4/36.4[4] GB	24X-10X	3/0	2/1
865345Y	24/10/00	2 x 750[2]	2/2	256	1GB/2GB	Rack(1U)	1/1	2 x 10/100	R-U2	1/0	18.2/36.4[4] GB	24X-10X	3/0	2/1
865346Y	24/10/00	2 x 750[2]	2/2	256	2GB/2GB	Rack(1U)	1/1	2 x 10/100	R-U2	1/0	36.4/36.4[4] GB	24X-10X	3/0	2/1
865351Y	24/10/00	1 x 650[2]	1/2	256	256MB/2GB	Rack(1U)	1/1	2 x 10/100	U	1/0	9.1/36.4[4] GB	24X-10X	3/1	2/1
865361Y	24/10/00	2 x 650[2]	2/2	256	512MB/2GB	Rack(1U)	1/1	2 x 10/100	U	1/0	18.2/36.4[4] GB	24X-10X	3/0	2/1
865362Y	24/10/00	2 x 650[2]	2/2	256	512MB/2GB	Rack(1U)	1/1	2 x 10/100	R-U2	1/0	18.2/36.4[4] GB	24X-10X	3/0	2/1

* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance.
1. The Netfinity 4000R does not support customer installation of adapters, HDDs, memory, processors, or any other devices that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.
2. Intel Pentium III processor with advanced transfer (full speed) L2 cache.
3. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
4. Standard Hard Disk drives (HDD) are 7200 RPM. Maximum internal capacities assume factory replacement of standard hard disk drives with the largest supported IBM hard disk drives.
5. Announced as a Business Model in Europe.
6. Not available from IBM after this date. Business Partner inventory may be available.

Note: General Availability of the Netfinity 4000R is limited to and supported in the following countries only at this time:- Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Luxembourg, MEEP*, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK.
*MEEP includes: Bahrain, U.A.E, Jordan, Kuwait, Lebanon, Oman, Pakistan, Qatar, Saudi Arabia, Syria, Egypt, Iran, Iraq, Yemen.

Netfinity 4000R Processor Upgrades

Part Number[1]	Pentium II with 512KB Cache	SMP Support
N/A	Netfinity 650 MHz/256 KB Upgrade with Pentium III Processor	51Y[2]

1. The Netfinity 4000R does not support customer installation of adapters, HDDs, memory, processors, or any other devices that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.
2. One additional processor can be installed, providing a maximum of two. all processors must be identical in type, speed and cache size.

Netfinity 4000R Memory Configurator

RDIMM Socket
RDIMM Socket
RDIMM Socket
RDIMM Socket

DIMM Description	Part Numbers
128MB 100MHz ECC SDRAM RDIMM	N/A[1]
256MB 100MHz ECC SDRAM RDIMM	N/A[1]
512MB 100MHz ECC SDRAM RDIMM	N/A[1]

1.The Netfinity 4000R does not support customer installation of adapters, HDDs, memory, processors, or any other devices that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.

Netfinity 4000R Internal Hard Disk Drive Configurator

Bays	Form Factor	Height	Front Access	Usage
1	5.25”	SL	yes	IDE CD-ROM
2[1]	3.5”	SL	no	HDD
3[1]	3.5”	SL	no	HDD

1. The Netfinity 4000R does not support customer installation of adapters, HDDs, memory, processors, or any other devices that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information

Part Numbers	Description	RPM	Height
N/A[1]	9.1GB 7200rpm SCSI HDD	7200	SL
N/A[1]	18.2GB 7200rpm SCSI HDD	7200	SL

1. A maximum of two SL HDDs may be installed. The Netfinity 4000R does not support customer installation of adapters, HDDs, memory, processors, or any other devices that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information

Internal SCSI Cabling

Netfinity 4000R models (except 865345Y, 46Y and 62Y) contain a single channel Wide Ultra SCSI adapter that has two 68-pin connectors to support SCSI device attachment. Up to two Wide Ultra SCSI HDDs can be supported internally. Models 865345Y, 46Y and 62Y contain a single ServeRAID-3L RAID adapter for internal use only. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.

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Netfinity 4000R I/O Options

Part Number	Description
Storage Controllers[2]	
N/A[1]	Netfinity ServeRAID-3L Ultra2 SCSI Adapter (i channel)
N/A[1]	PCI Fast/Wide Ultra SCSI Adapter (1 channel)
N/A[1]	Ultra SCSI Adapter (2 channel)
N/A[1]	Ultra2 SCSI Adapter (1 channel)
Networking[3]	
N/A[1]	Netfinity 10/100 Ethernet PCI Adapter 2
N/A[1]	Netfinity Gigabit Ethernet SX Adapter
N/A[1]	16/4 Token-Ring PCI Management Adapter

1. The Netfinity 4000R does not support customer installation of adapters, HDDs, memory, processors, or any other devices that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.
2. Netfinity 4000R models 865345Y, 46Y and 62Y contain a single channel ServeRAID-3L adapter for internal use only. Other models contain a single channel Wide Ultra SCSI adapter with an internal 68-pin connector supporting up to two internal HDDs.
3. Netfinity 4000R contains two integrated 10/100 PCI Ethernet controllers.

Part Number	Description
	Power[1]
94G7448	Power Cable Type C12 (3.7m, 12 ft.)[2]
	Power Distribution Unit (PDU)
2PDUxxx[23]	200-240V Power Distribution Unit[3]
	Uninterruptible Power Supply (UPS)[4]
14RIxxx[22]	APC Smart-UPS 1400RMiB[5]
30RIxxx[22]	APC Smart-UPS 3000RMiB[6]
37L6862	APC Smart-UPS 5000RMiB[7]
	Monitors[8]
T3347xx[19]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[9]
31H2Nxx[19]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[9]
T32N3xx[19]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[9]
T274Axx[19]	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[9]
11AG1xx[19]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[10]
	Rack and NetBay[11]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack[12]
9306910	Netfinity Rack (Perforated Doors)[12]
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22[12]
36L9702	NetBAY22 Rack Extension Kit
	Keyboard and Mouse[13]
28L36xx[20]	Space Saver Keyboard[14, 15]
28L36xx[21]	Preferred Keyboard (stealth black)[16]
28L3675	Sleek 2-Button Stealth Black Mouse
	Console Options[8,17]
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit
94G7445	Console Server Selector Switch (8-port)
28L0542	Netfinity Console Server Selector Switch (4-port)
94G7447	Console Cable Set - 12 ft. (3.66m)[17,18]

1. Netfinity 4000R includes a single 150W power supply and a single 2.8 m (9 ft.) power cord for attachment to a high voltage UPS or PDU.
2. For attachment to a high voltage UPS or PDU.
3. Contains ten IEC 320-C13 outlets and three communication links, Supports up to 16 amps.
4. For runtimes and UPS attributes, see Appendix C: UPS Runtime Estimates.
5. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
6. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
7. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
8. An available port on a console switch is required for each Netfinity 4000R.
9. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
10. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
11. Netfinity 4000R is housed in a 19" rack mountable drawer and requires one of the racks listed here. See IBM Netfinity Rack cabinet and Options section for IBM rack supported devices. To provide adequate cooling, a blank filler panel should be placed on the front of any unused rack space. If non-IBM racks are to be used, assure that both front and rear doors offer approximately 60% open area uniformly distributed and in line with installed servers. A clearance of 51 to 64-mm (2 to 2-1/2 inches) must be maintained between the front door and the system unit's front bezel. The rear door must maintain the same or greater clearance. Clearance between the EIA mounting rails and rack side covers must be less than 13-mm (1/2-inch) to prevent air re-circulation from back to front. Non-rack installations are not supported.
12. Rack Extension kits 36L9703 and 36L9702 are recommended for 93069xx and 9306200 respectively, to provide sufficient room for cable management.
13. The Netfinity 4000R does not include a keyboard or mouse.
14. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
15. Advanced TrackPoint IV features are not available on IBM Netfinity sy.stems.
16. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
17. The Netfinity 4000R ships with a 4 foot console cable which should be sufficient for most customer's needs. One end of this cable plugs into the system unit, the other end has male connectors and plugs into the Console Switch, carrying the keyboard, mouse and video signals. In exceptional circumstances, should the longer 12 foot Console Cable P/N 94G7447 be required, a special adapter cable has to be ordered directly from the manufacturer. This adapter cable plugs into the system unit and has female connectors for keyboard, mouse and video on the outbound end, thus enabling it to be connected to the Console Cable P/N 94G7447. This adapter cable is known as the KVM cable, it has a vendor part number of 09N7179 and requests should be sent to Julie Laws at Airspeed LLC (julie.laws@airspeedllc.com) or telephone 00-1-919-644-1222.
18. Required to connect server to console switch.
19. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
20. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
21. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=UK English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
22. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe
23. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe..

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

IBM Netfinity 6000R Configurator

Part Number*	Withdrawal Date: ddmmyy	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R=RDIMM)[3]	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[5]	Bays: (Tot/Av)	Slots: (Tot/Av)
21RYMxx[1]	-	700	1/4	1024	512MB(R)/16GB	Rack(4U)	1/3	P, S, H,F	S-Fans O-Power[4]	Y	10/100	D,U160	2/0	0/218.4 GB	40X-17X	8/6[6]	6/6
22RYMxx[1]	-	700	1/4	2048	512MB(R)/16GB	Rack(4U)	1/3	P, S, H,F	S-Fans O-Power[4]	Y	10/100	D,U160	2/0	0/218.4 GB	40X-17X	8/6[6]	6/6

* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Netfinity 6000R Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III Xeon processor with full speed ECC L2 cache and 100 MHz access to memory and I/O buses. IBM intends to make available a Netfinity 6000R model containing an Intel 800 MHz/2 MB L2 Cache Pentium II Xeon processor when Intel makes this processor generally available to the marketplace.
3. Advanced Chipkill ECC memory corrects two-, three-, and four-bit memory errors.
4. N+1 power supply redundancy requires a minimum of one optional Netfinity 270 W Hot-Swap Redundant Power Supply P/N 37L6879. Robust configurations may require two. See "Power" under "Netfinity 6000R Power, Monitors, Accessories" for additional information.
5. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
6. Netfinity 6000R includes three hot-swap bays. Optional Netfinity 3-Pack Ultra 160 Hot-Swap Expansion Kit P/N 33L5050 expands the total hot-swap bays to six.

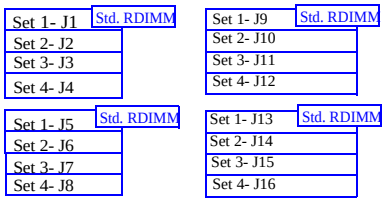
Netfinity 6000R Processor Upgrades

Part Number	Processor Upgrades with Full Speed Cache	SMP Support[1]	Processor Speed Upgrade[2]
00N7946	Netfinity 700 MHz/1 MB Upgrade with Pentium III Xeon Processor	1RY	-
00N7944	Netfinity 700 MHz/2 MB Upgrade with Pentium III Xeon Processor	2RY	1RY

1. Three additional processors may be installed, providing a maximum of four. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of four processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

1. Netfinity 6000R is housed in a 19" rack mountable drawer and requires one of the racks listed here. See "IBM Netfinity Rack Cabinet and Options" section for IBM rack supported devices.
2. Netfinity 6000R ships without a keyboard or mouse.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
5. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
6. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
7. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.

Netfinity 6000R Memory Configurator



All RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4.

Total Memory[1]	Quantity of RDIMMs Added[2]			
	128 MB (P/N 33L3113)	256 MB (P/N 33L3115)	512 MB (P/N 33L3117)	1 GB (P/N 33L3119)
512 MB	4 x 128 RDIMMs standard	-	-	-
1.0 GB	4	-	-	-
1.5 GB	-	4	-	-
2.0 GB	4	4	-	-
2.5 GB	-	8	-	-
3.0 GB	4	-	4	-
4 GB	4	4	4	-
5 GB	4	-	8	-
6 GB[3]	-	8	8	-
7 GB[3]	-	4	12	-
8 GB[3]	-	-	16	-
9 GB	4	-	-	8
10 GB[3]	-	-	12	4
12 GB[3]	-	-	8	8
14 GB[3]	-	-	4	12
16 GB[3] (max)	-	-	-	16

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. To obtain the quantity of memory identified in the "Total Memory" column, select the appropriate row and order the quantity of RDIMMs identified in all columns for that row. Example: For 2.0 GB, order 4 x 33L3113 plus 4 x 33l3115.
3. Requires removal of standard RDIMMs.

Part Number	Memory Description[1]
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM
33L3117	Netfinity 512 MB, 100 MHz ECC SDRAM RDIMM
33L3119	Netfinity 1 GB 100 MHz ECC SDRAM RDIMM

1. Due to four-way interleaving all RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4. Chipkill support is provided on the memory card.

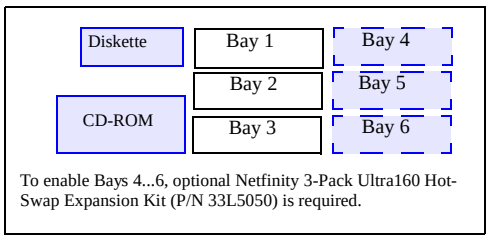
Netfinity 6000R Internal Hard Disk Drive Configurator

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 37L7201)	18.2 GB (P/N 37L7202)	36.4 GB (P/N 37L7203)	9.1 GB (P/N 37L7204)	18.2 GB (P/N 37L7205)	36.4 GB (P/N 37L7206)
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4[2]	2	1	4[2]	2	1
45.5 GB	5[2]	-	-	5[2]	-	-
54.6 GB	6[2]	3	-	6[2]	3	-
72.8 GB	-	4[2]	2	-	4[2]	2
91 GB	-	5[2]	-	-	5[2]	-
109.2 GB	-	6[2]	3	-	6[2]	3
145.6GB	-	-	4[2]	-	-	4[2]
182GB	-	-	5[2]	-	-	5[2]
218.4GB (max)	-	-	6[2]	-	-	6[2]

This table does not represent all possible hard drive configurations.
1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2. Requires Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050.

Bay	Form Factor	Height	Front Access	Usage
-	89 mm (3.5")	SL	Yes	Diskette
-	133 mm (5.25")	HH	Yes	IDE CD-ROM
1...3	HS	SL[1]	Yes	Open
4...6[2]	HS	SL[1]	Yes	Open

1. Half-high (HH) devices are NOT supported.
2. To enable Bays 4...6, optional Netfinity 3-Pack Utra160 Hot-Swap Expansion Kit P/N 33L5050 is required.



To enable Bays 4...6, optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) is required.

Part Number	Description	RPM	Height	Bays Supported[1]	Max. Qty.
Ultra160 Hard Disk Drives (HDD)					
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...6	6[1]
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...6	6[1]
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...6	6[1]
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...6	6[1]
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...6	6[1]
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...6	6[1]
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1...6	6[1]
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15000	SL	1...6	6[1]
Associated Options					
33L5050	Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit[2]	-	3 x SL	4...6	-

External Storage Expansion Units[3]		Form Factor
00N6xxx[8]	EXP200 Storage Expansion Unit[4,7]	Rack (3U)
37L0xxx[9]	EXP200 350 W Redundant Power Supply[7]	-
19K11xx[10]	EXP300 Storage Expansion Unit[5,7]	Rack (3U)
00N71xx[11]	FAStT EXP500 Storage Expansion Unit[6,7]	Rack (3U)
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[7]	-

1. Netfinity 6000R ships with bays 1...3 enabled. To enable installation of greater than three HDDs requires Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050.
2. Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit P/N 33L5050 includes a hot-swap backplane and associated components for two cabling options. Within the option are two 16-bit LVD SCSI cables. One can be attached from the 3-pack Ultra160 Hot-Swap backplane to the second connector of the dual-channel Ultra160 SCSI controller, the other, through the use of a repeater card included with the option, can be cabled directly to the standard backplane. Utilising the second channel will eliminate the possibility of attaching external devices to that channel.
3. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
4. EXP200 includes a single 2 M Ultra2 SCSI cable and single hot-swap 350W power supply. Optional hot-swap EXP200 350W Power Supply (P/N 37L0xxx) provides redundancy.
5. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies.
6. FAStT EXP500 Storage Expansion Unit includes dual hot-swap 350W power supplies.
7. These units do not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order Rack Power Cables according to the number of power supplies.
8. Where 'xxx' represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English:- Line Cords/ Publication Country Kits are included throughout.
9. Where 'xxx' represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.
10. Where 'xx' represents a specific country code: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included throughout.
11. Where 'xx' represents a country specific code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English. Country/ Language Line Cords/Publications are included as indicated.

Internal SCSI Cabling

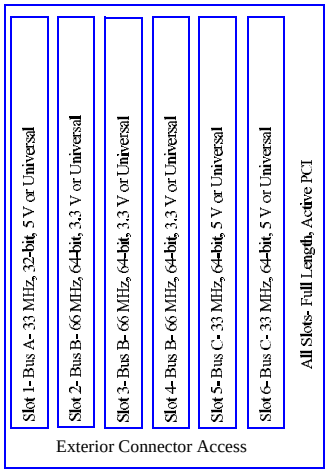
The Netfinity 6000R contains a DASD backplane supporting three hot-swap, SCA-2 compliant drive bays. The backplane is connected to one of the internal connectors of the integrated dual-channel Ultra160 SCSI controller through a 16-bit LVD SCSI cable. An optional Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit (P/N 33L5050) can be installed to provide additional internal HDD storage capacity. Within this option are two 16-bit LVD SCSI cables. One can be attached from the 3-Pack Ultra Hot-Swap backplane to the second connector of the dual-channel Ultra160 SCSI controller, the other, through the use of a repeater card included with the option, can be cabled directly to the standard backplane.

In configurations where external SCSI device attachment is required instead of additional internal HDD storage, a second 16-bit LVD SCSI cable is included with the server. One end of the cable can be attached to the second Ultra160 connector and the other is attached to the external 0.8-mm VHDCI connector on the back of the chassis. This provides an external connection to support LVDS devices.

Netfinity 6000R I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]	Hot-Plug[2]	PCI Voltage Key	MHz
	Storage Controllers[3]						
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II[5]	Full	32-bit	1, 5...6	X	5	33
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[6]	Full	32/64-bit	1, 5...6	X	5	33
37L6091	Netfinity ServeRAID-4L Ultra160 SCSI Controller[7]	Full	32/64-bit	1...6[4]	X	Universal	33
37L6080	Netfinity ServeRAID-4M Ultra160 SCSI Controller[8]	Full	32/64-bit	1...6[4]	X	Universal	33
37L6889	Netfinity ServeRAID-4H Ultra160 SCSI Controller[9]	Full	32/64-bit	1...6[4]	X	Universal	33
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1, 5...6	-	5	33
19K4646	PCI Wide Ultra160 SCSI Adapter[10]	Half	32/64-bit	1...6	-	Universal	66
	Fibre Storage Controller and Options[11]						
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...6	X	Universal	66
19K11xx[22]	FAStT200 Storage Server	-	-	-	-	-	-
19K11xx[23]	FAStT200 HA Storage Server	-	-	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-	-	-	-
	Networking[12]						
	Ethernet						
09N9901	Netfinity 10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...6[4]	X	Universal	33
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...6[4]	X	Universal	33
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1...6[4]	X	Universal	33
	Token Ring						
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[13]	Half	32-bit	1...6[4]	X	Universal	33
	Communications[14]						
37L14xx	Serial I/O SST 8, 16, and 128 port adapters[15]	Half	32-bit	1, 5...6	-	5	33
	Systems Management[16]						
36L96xx[21]	Netfinity Advanced System Management PCI Adapter[17, 18]	Full	32-bit	1, 5...6[18]	-	5	33
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[19]	-	-	-	-	-	-
36L9654	Netfinity Advanced System Management Token-RIng Connection[20]	-	-	-	-	-	-

1.The 5 V - 33 MHz slots support Universal or 5 V adapters. A universal voltage-66 MHz adapter plugged into these slots will operate at 33 MHz.The 3.3 V slots support universal or 3.3 V adapters. A universal voltage-33 MHz adapter plugged into these slots limits a 66 MHz PCI adapter installed on the same bus to 33 MHz.
2. All 6 slots are full length hot-plug capable using IBM's Active PCI technology. For Network Operating System support access URL www.ibm.com/pc/us/compat
3. Netfinity 6000R includes a dual-port, dual-channel Ultra160 SCSI controller. See "Internal SCSI Cabling" for cabling alternatives.
4. Installation of a 33 MHz adapter into a Bus B 66 MHz slot will slow operation of all Bus B slots to 33 MHz.
5. Netfinity ServeRAID-3L Ultra2 SCSI Adapter II (P/N 19K0564) provides either one internal or one external (0.8-mm VHDCI) LVDS SCSI channel.
6. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter P/N 37L6086 provides one internal and 2 external (0.8-mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8-mm VHDCI) providing a total of 3 external LVDS SCSI channels. Includes 32MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
7. Netfinity ServeRAID-4L Ultra160 SCSI controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and either one internal or one external Ultra160 connection. External connector is 0.8-mm VHDCI.
8. Netfinity ServeRAID-4M Ultra160 SCSI controller is powered by a 100MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI.
9. Netfinity ServeRAID-4H Ultra160 SCSI controller is powered by a 266MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilized). External connectors are 0.8-mm VHDCI.
10. PCI Wide Ultra160 SCSI Adapter (P/N 19K4646) provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
11. See Fibre Array Solutions section for additional configuration information.
12. Netfinity 6000R has an integrated 10/100 PCI Ethernet Controller.
13. The Wake on LAN function of this option is not supported by Netfinity servers.
14. Netfinity 6000R includes two USB ports, two serial and one parallel port.
15. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (any combination of P/N 37L1414, 37L1415, 37L1416) may be installed.
16. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into Netfinity 6000R works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter P/N 36L96xx and Netfinity Advanced System Management Interconnect Cable Kit P/N 03K9309 additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
17. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter which requires a separate power source. Provides an integrated 10/100 Ethernet port and PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection P/N 36L9654.
18. A maximum quantity of one is supported.
19. Required for all xSeries and Netfinity servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1xX to 4xX are not supported). Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
20. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter, and a PC Card to 9-pin D-Shell cable which is routed to an available adapter slot opening (reduces available slots by one). The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together.
21. Where 'xx' represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.
22.Where 'xx' represents a country specific code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English. Country/Language - Line Cords/Publications are included as indicated
23.Where 'xx' represents a country specific code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English. Country/Language - Line Cords/Publications are included as indicated.



Netfinity 6000R Power, Monitors, Accessories

Part Number	Description
Power[1,9]	
37L6879	270 W Hot-Swap Redundant Power Supply[2,9]
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[9]
Uninterruptible Power Supply (UPS)[3]	
14RIxxx[11]	APC Smart-UPS 1400RMB[4]
30RIxxx[11]	APC Smart-UPS 3000RMB[4]
37L6862	APC Smart-UPS 5000RMB[5]
Monitors[6]	
T3347xx[10]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[7]
31H2Nxx[10]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[7]
T32N3xx[10]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[7]
T274Axx[10]	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[7]
11AG1xx[10]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[8]

Part Number	Description
Rack and NetBAY[1,8]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated front door)
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22
36L9702	Netfinity NetBAY22 Rack Extension Kit
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit
94G7448	Rack Power Cable Type C12 (3.7m)[8]
Keyboard and Mouse[2]	
28L36xx[6]	Space Saver II Keyboard[3, 4]
28L36xx[7]	Preferred Keyboard (stealth black)[5]
28L3675	Sleek 2-Button Stealth Black Mouse

1. Netfinity 6000R systems include a single 270 W, hot-swap power supply. N+1 power supply redundancy may be achieved with the addition of optional 270 W Hot-Swap Redundant Power Supply P/N 37L6879. Redundancy for configurations of greater than 270 W requires installation of a second optional supply. To assist in determining when an additional power supply is required to preserve redundancy, a "Non-Redundant LED" is a standard feature of the Netfinity 6000R. The following table is provided as a reference.

Number of Power Supplies	System Configuration Supported
	Non-Redundant
	Up to two processors
1	Up to three PCI adapters
	Up to three HDDs
	Up to eight memory RDIMMs

2. Netfinity 270 W Hot-Swap Redundant Power Supply P/N 37L6879 includes a single standard country power cord.
3. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
4. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
5. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
6. Netfinity 6000R uses an SVGA controller (S3 Savage4 chipset) with 8 MB of video memory.
7. Installation within a rack requires optional Monitor Compartment (P/N 94G7444).
8. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
9. Rack Power Cable P/N 94G7448 (type C12 - one for each power supply), must be ordered for power connection to a high voltage UPS or PDU.
10. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
11. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe

1. Netfinity 6000R is housed in a 19" rack mountable drawer and requires one of the racks listed here. See "IBM Netfinity Rack Cabinet and Options" section for IBM rack supported devices.
2. Netfinity 6000R ships without a keyboard or mouse.
3. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
4. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
5. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
6. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
7. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
8. The Netfinity 6000R ships with a standard country power cord. For connection to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.

Netfinity 6000R Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures
01K1325	20/40GB 8-mm Internal SCSI Tape Drive	N/A[1]	16	133 mm (5.25") HH	N	N	03K8756
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	N/A[1]	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	03K8756[2]
09N4040	20/40 GB DLT Internal SCSI Tape Drive	N/A[1]	8	133 mm (5.25") FH	N	Y	03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[2]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	N/A[1]	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	03K8756[2]
Tape Autoloaders							
00N7992	120/240GB DDS/4 Tape Autoloader	N/A[1]	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[2]
External Tape Libraries[3]							
00N79xx[7]	DLT Tape Library	-	16	Rack	Y	N/A	-
External Tape Enclosures							
03K8756	NetMEDIA Storage Expansion Unit EL[4]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[5]	-	16 LVD	-	N	N	03K8756
Associated Options							
10K2340	Media Bay Tray and LVD Cable Kit[2,6]	-	16 LVD	Int.	Y	N	-

1. Netfinity 6000R does not support internal tape drives. An external tape or tape enclosure must be used. If not used internally, the second integrated Ultra160 connector may be routed to an external 0.8-mm VHDCI connector with a cable included with the server. All tape drives and enclosures are supported by PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which has an external 0.8-mm VHDCI connector. Select tape drive, enclosure and supported adapter then use Appendix D: Cables-Storage Units-Controllers to select an appropriate external cable.
2. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL P/N 03K8756 requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit P/N 10K2340 which contains a single two-drop mult-mode terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
3. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
4. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack-mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
5. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
6. Media Bay Tray and LVD Cable Kit P/N 10K2340 includes an internal two-drop multi-mode terminated LVD SCSI cable.
7. Where 'xx' represents a country specific power cord code: *Rack versions* - 81=EU1,82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

NOTE: Additional tape drive information can be found in Appendix A: Tape Drive Attributes.

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

Netfinity 6000R Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Internet Server

Part Number	Description	Quantity
21RYMxx	Netfinity 6000R 700/1 MB Xeon, 512 MB(R) ECC, Open, 40X, PCI (Rack 4U)	1
19K0564	Netfinity ServeRAID-3L Ultra2 SCSI Adapter II	1
33L5050	Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit	1
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD[1]	4
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1
03K8756	NetMEDIA Storage Expansion Unit EL	1
03K9310	Netfinity 2 M Ultra2 SCSI Cable	1
31H2Nxx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
14RIxxx	APC Smart-UPS 1400RMB	1
Industry Standard 19” Rack, EIA-310D, min. depth of 28” (711 mm)		
9306200	Netfinity NetBAY22	1
28L36xx	Space Saver II Keyboard	1
94G6670	Blank Filler Panel Kit	2

1. For a total of 18.2 GB of RAID protected, hot-swap, hot-spare internal storage.

An Internet server is a server that handles all requests from the Internet (intranet or extranet). Usually, this type of server has the same characteristics as a file server. The main difference is that an internet server talks a different language (TCP/IP vs. NETBEUI or IPX/SPX) and often needs to do an extra security check (firewall). In the case of an Internet server, the server itself talks mostly to just one client, the Internet Service Provider (ISP), instead of many clients like a file server does.

With this in mind, the IBM Netfinity 6000R was selected to provide an affordable price point for the growing internet server market, 512 MB of system memory (expandable to 16 GB), and availability features such as RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

The network configuration depends on the method that will be used to connect the server to the Internet. Usually fast Ethernet routers are used, but if other methods are used, you can add the appropriate adapter. The configuration includes a tape backup unit for secure backup of critical data in the event of a system or storage failure.

Application Server

Part Number	Description	Quantity
22RYMxx	Netfinity 6000R 700/2 MB Xeon, 512 MB(R) ECC, Open, 40X, PCI (Rack 4U)	1
00N7944	Netfinity 700 MHz/2 MB Upgrade with Pentium III Xeon Processor	3
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM[1]	4
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM[1]	4
33L5050	Netfinity 3-Pack Ultra160 Hot-Swap Expansion Kit	1
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD[2]	4
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	1
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1
03K8756	NetMEDIA Storage Expansion Unit EL	1
10L7113	NetMEDIA Systems Management Adapter	1
03K9310	Netfinity 2 M Ultra2 SCSI Cable	1
31H2Nxx	E54 Color Monitor 15” (350 mm, 13.8” Viewable Image Size), stealth black	1
14RIxxx	APC Smart-UPS 1400RMB	1
37L6879	Netfinity 270 W Hot-Swap Redundant Power Supply	2
Industry Standard 19” Rack, EIA-310D, min. depth of 28” (711 mm)		
9306200	Netfinity NetBAY22	1
28L36xx	Space Saver II Keyboard	1
94G6670	Blank Filler Panel Kit	2

1. For a total of 2 GB of system memory.
2. For a total of 109.2 GB usable RAID 5 storage.

An application server is designed to handle a high workload while providing application serving requirements for users. With this in mind, the IBM Netfinity 6000R was selected to provide an affordable price point for an application server, with four-way Pentium III Xeon processing, 2 GB of system memory (expandable to 16 GB), and availability features such as battery-backed cache RAID protected internal hot-swap storage and power protection with an APC Smart-UPS.

IBM Netfinity 7100 Configurator

Part Number*	Withdrawal Date:ddmmyy[4]	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R = RDIMM)	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[3]	Bays: (Tot/Av)	Slots: (T/A)
611YExx	24/10/00	550	1/4	512	256MB(R)/16GB	Tower	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X-17X	14/12	6/6
61RYExx[1]	24/10/00	550	1/4	512	256MB(R)/16GB	Rack(8U)	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X-17X	14/12	6/6
621YExx	24/10/00	550	1/4	1024	256MB(R)/16GB	Tower	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X-17X	14/12	6/6
62RYExx[1]	24/10/00	550	1/4	1024	256MB(R)/16GB	Rack(8U)	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X-17X	14/12	6/6
631YMxx	-	700	1/4	1024	256MB(R)/16GB	Tower	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X-17X	14/12	6/6
63RYMxx[1]	-	700	1/4	1024	256MB(R)/16GB	Rack(8U)	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X-17X	14/12	6/6
641YMxx	-	700	1/4	2048	256MB(R)/16GB	Tower	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X-17X	14/12	6/6
64RYMxx[1]	-	700	1/4	2048	256MB(R)/16GB	Rack(8U)	2/4	P, H,F	S-Fans S-Power	Y	10/100	D,U2	4/2	0/364GB	40X-17X	14/12	6/6

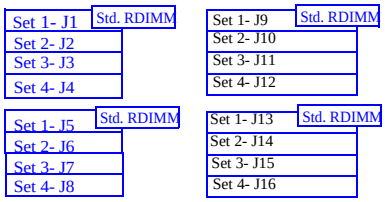
* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance.
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Netfinity 7100 Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III Xeon processor with advanced transfer (full speed) L2 cache and 100 MHz access to memory and I/O buses.
3. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
4. Not available from IBM after this date. Business Partner inventory may be available.

Netfinity 7100 Processor Upgrades

Part Number	Processor Upgrades with Full Speed Cache	SMP Support[1]	Processor Speed Upgrade[2]
33L5056	Netfinity 550 MHz/512 KB Upgrade II with Pentium III Xeon Processor	1xY	-
33L5057	Netfinity 550 MHz/1 MB Upgrade II with Pentium III Xeon Processor	2xY	All 1xY
10K2331	Netfinity 700 MHz/1 MB Upgrade II with Pentium III Xeon Processor	3xY	All 1...2xY
10K2332	Netfinity 700 MHz/2 MB Upgrade II with Pentium III Xeon Processor	4xY	All 1...3xY

1. Three additional processors may be installed, providing a maximum of four. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of four processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

Netfinity 7100 Memory Configurator



All RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4.

Total Memory[1]	Quantity of RDIMMs Added[2]				
	64 MB (P/N 33L3067)	128 MB (P/N 33L3113)	256 MB (P/N 33L3115)	512 MB (P/N 33L3117)	1 GB (P/N 33L3119)
256 MB	4 x 64 RDIMMs Standard	-	-	-	-
512 MB	4	-	-	-	-
768 MB	-	4	-	-	-
1.0 GB	4	4	-	-	-
1.2 GB	-	-	4	-	-
1.7 GB	-	4	4	-	-
2.0 GB	4	4	4	-	-
2.7 GB	-	4	-	4	-
3.0 GB	4	4	-	4	-
3.2 GB	-	-	4	4	-
3.7 GB	-	4	4	4	-
4 GB[3]	-	8	4	4	-
5 GB[3]	-	-	12	4	-
6 GB[3]	-	-	8	8	-
7 GB[3]	-	-	4	12	-
8 GB[3]	-	-	-	16	-
9 GB[3]	-	-	4	8	4
10 GB[3]	-	-	-	12	4
12 GB[3]	-	-	-	8	8
14 GB[3]	-	-	-	4	12
16 GB[3] (max)	-	-	-	-	16

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.
1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. To obtain the quantity of memory identified in the "Total Memory" column, select the appropriate row and order the quantity of RDIMMs identified in all columns for that row. Example: For 1.0 GB, order 4 x 33L3067 and 4 x 33L3113.
3. Requires removal of standard memory DIMMs.

Part Number	Memory Description[1]	Upgrade 10K2169 Compatible[2]
33L3067	Netfinity 64 MB, 100 MHz ECC SDRAM RDIMM	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	X
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM	X
33L3117	Netfinity 512 MB, 100 MHz ECC SDRAM RDIMM	X
33L3119	Netfinity 1 GB 100 MHz ECC SDRAM RDIMM[3]	X
10K2169	Netfinity Active PCI/Chipkill Upgrade Kit[3]	X

1. Due to four-way interleaving all RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4.
2. Memory designated by an "X" may be used with NetfinityActive PCI/Chipkill Upgrade Kit P/N 10K2169.
3. Netfinity Active PCI/Chipkill Upgrade Kit P/N 10K2169 provides an upgrade to hot-swap PCI slots and "Chipkill" ECC memory.

Netfinity 7100 Internal Hard Disk Drive Configurator

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 37L7201)[2]	18.2 GB (P/N 37L7202)[2]	36.4 GB (P/N 37L7203)[2]	9.1 GB (P/N 37L7204)[2]	18.2 GB (P/N 37L7205)[2]	36.4 GB (P/N 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4	2	1	4	2	1
45.5 GB	5	-	-	5	-	-
54.6 GB	6	3	-	6	3	-
63.7GB	7	-	-	7	-	-
72.8 GB	8	4	2	8	4	2
81.9GB	9	-	-	9	-	-
91 GB	10	5	-	10	5	-
109.2 GB	-	6	3	-	6	3
127.4GB	-	7	-	-	7	-
145.6GB	-	8	4	-	8	4
163.8GB	-	9	-	-	9	-
182GB	-	10	5	-	10	5
218.4GB	-	-	6	-	-	6
254.8GB	-	-	7	-	-	7
291.2 GB	-	-	8	-	-	8
327.6 GB	-	-	9	-	-	9
364 GB (max)	-	-	10	-	-	10

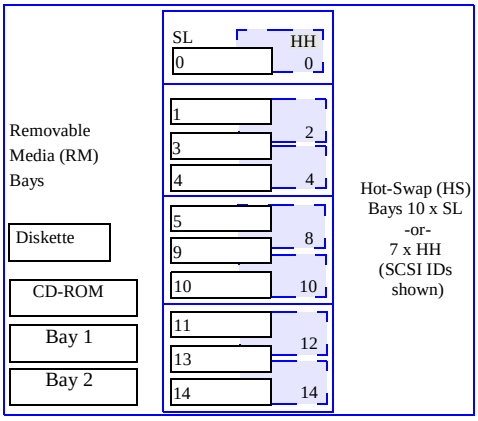
This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.
2. Netfinity 7100 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.

Bay	Form Factor	Height	Front Access	Usage
-	89 mm (3.5”)	SL	Yes	Diskette
-	133 mm (5.25”)	HH	Yes	IDE CD-ROM
RM 1	133 mm (5.25”)	HH[1]	Yes	Open
RM 2	133 mm (5.25”)	HH[1]	Yes	Open
1...10 or 1...7	HS	SL or HH[2]	Yes	Open
NB3[3]	19” Rack	3U	Yes	Open

1. Two half-high (HH) bays can be combined to support a single full-high (FH) device

2. The top bay is HH; all others are configured in groups of 3 SL bays. When a HH drive is installed in one of these groups, only another HH or a single SL drive can be installed in the same group. For clarity, the SCSI IDs are identified.

3. Tower configured systems support installation of up to 3 NetBAY3s. See IBM Netfinity NetBAY3 Stackable Enclosure section for supported devices.



Netfinity NetBAY3 (NB3)
(Optional on Tower Configurations)

1. The top bay is HH; all others are configured in groups of three SL bays. When a HH drive is installed in one of these groups, only another HH or a single SL drive can be installed in the same group. For clarity, the SCSI IDs are identified.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
Ultra160 Hard Disk Drives (HDD)[1]					
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	See diagram	10
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	See diagram	10

	External Storage Expansion Units[2]	Form Factor
00N6xxx[7]	Netfinity EXP200 Storage Expansion Unit[3, 6]	Rack (3U)
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	-
37L0xxx[8]	Netfinity EXP200 350 W Redundant Power Supply[6]	-
19K11xx[9]	EXP300 Storage Expansion Unit[4, 6]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
00N71xx[10]	FAStT EXP500 Storage Expansion Unit[5, 6]	Rack (3U)
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[6]	-

1. Netfinity 7100 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
3. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350 W power supply. Optional hot-swap Netfinity EXP200 350W Power Supply (P/N 37L0xxx) provides redundancy. To convert an EXP200 to a tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 37L5857) is required.
4. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500 W power supplies. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit P/N 09N7296 is required.
5. FAStT EXP500 Storage Expansion Unit includes dual hot-swap 350 W power supplies.
6. These units do not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order Rack Power Cables according to the number of power supplies.

7. Where ‘xxx’ represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English:- Line Cords/ Publication Country Kits are included throughout.
8. Where ‘xxx’ represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.
9.Where ‘xx’ represents a specific country code: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included throughout.
10. Where ‘xx’ represents a country specific code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English. Country/ Language Line Cords/Publications are included as indicated.

Internal SCSI Cabling

The Netfinity 7100 contains a DASD backplane supporting ten hot-swap, SCA-2 compliant drive bays. The backplane is connected to Channel B of the integrated dual-channel, Wide Ultra2 SCSI controller through a 16-bit LVD SCSI cable. Channel A only supports external SCSI attachment and is cabled directly to the external 0.8mm VHDCI SCSI connector. To support devices in the internal 133/89-mm (5.25/3.5-inch) half-high bays, a two-drop, 16-bit LVD SCSI cable with integrated terminator is included with the server. This cable can be used to connect to an optional SCSI adapter or, in the case of RAID configurations where the backplane cable is attached to an optional RAID adapter, it can be connected to the Channel B connector.

Netfinity 7100 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]	Hot-Plug[2]	PCI Voltage Key	MHz
	Storage Controllers[3]						
01K7364	Netfinity ServeRAID-3L Ultra2 SCSI Adapter[4]	Full	32-bit	3...6	X	5	33
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[5]	Full	32/64-bit	3...6	X	5	33
37L6091	Netfinity ServeRAID-4L Ultra160 SCSI Controller[6]	Full	32/64-bit	1...6	X	Universal	33
37L6080	Netfinity ServeRAID-4M Ultra160 SCSI Controller[7]	Full	32/64-bit	1...6	X	Universal	33
37L6889	Netfinity ServeRAID-4H Ultra160 SCSI Controller[8]	Full	32/64-bit	1...6	X	Universal	33
19K4646	PCI Wide Ultra160 SCSI Adapter[18]	Half	32/64-bit	1...6	-	Universal	66
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	3...6	-	5	33
	Fibre Storage Controller[9]						
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...6	X	Universal	66
19K11xx[22]	FAStT200 Storage Server	-	-	-	-	-	-
19K11xx[23]	FAStT200 HA Storage Server	-	-	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-	-	-	-
	Networking[10]						
	Ethernet						
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...6	X	Universal	33
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1...6	X	Universal	33
	Token Ring						
34L5001	16/4 Token-Ring PCI Management Adapter[11]	Half	32-bit	1...6	X	Universal	33
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[11]	Half	32-bit	1...6	X	Universal	33
34L5201	High speed 100/16/4 Token Ring PCI Management Adapter	Half	32-bit	1...6	X	Universal	33
	Communications[12]						
	Systems Management[13]						
36L96xx[21]	Netfinity Advanced System Management PCI Adapter[14,15]	Full	32-bit	3...6[15]	-	5	33
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[16]	-	-	-	-	-	-
36L9654	Netfinity Advanced System Management Token-Ring Connection[17]	-	-	-	-	-	-
	Host Attach						
10L7368	Netfinity ESCON Adapter[19,20]	Full	32-bit	3...6[20]	-	5	33
	Other						
10K2169	Netfinity Active PCI/Chipkill Upgrade Kit[2]	-	-	3...6	X	-	-

1.The 5 V slots support Universal or 5 V adapters. The 3.3 V slots support 3.3 V adapters. A Universal Keyed 66 MHz adapter plugged into a 33 MHz slot will operate at 33 MHz. A Universal Keyed 33 MHz adapter plugged into a 66 MHz slot limits other adapters installed on the same bus to 33 MHz.
2. Netfinity 7100 does not ship with hot-plug PCI slots. The addition of optional Netfinity Active PCI/Chipkill Upgrade Kit P/N 10K2169 provides slots 3-6 with hot-plug capability using IBM's Active PCI technology. For Network Operating System support access URL www.ibm.com/pc/us/compat
3.Netfinity 7100 includes a dual-port, dual-channel, 64-bit Wide Ultra2 SCSI controller with one internal connector and one external port with a 0.8-mm Very High Density Connection Interface (VHDCI).
4. Netfinity ServeRAID-3L Ultra2 SCSI Adapter P/N 01K7364 provides either one internal or one external (0.8-mm VHDCI) LVDS SCSI channel.
5. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter P/N 37L6086 provides one internal and 2 external (0.8-mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8-mm VHDCI connector) providing a total of 3 external LVDS SCSI channels. Includes 32MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
6. Netfinity ServeRAID-4L Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides a single channel, 16 MB of ECC cache and one internal or one external Ultra160 connection. External connectors are 0.8-mm VHDCI.
7. Netfinity ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilised). External connectors are 0.8-mm VHDCI.
8. Netfinity ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilised). External connectors are 0.8-mm VHDCI.
9. See Netfinity Fibre Array Solutions section for additional configuration information.
10. Netfinity 7100 includes a full-duplex, 10/100 Mbps Ethernet PCI Controller.

11. The Wake on LAN function of this option is not supported by Netfinity servers.
12. Netfinity 7100 includes two USB ports, two high-speed serial/asynchronous ports, (NS16550A compatible), and one high-speed (up to 2 MB/sec. data transfer speed) bi-directional parallel port supporting devices using ECP/EPP/SSP protocols adhering to the IEEE 1284 standard.
13. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into Netfinity 7100 works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter P/N 36L96xx and Netfinity Advanced System Management Interconnect Cable Kit P/N 03K9309 additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
14. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter which requires a separate power source. Provides an integrated 10/100 Ethernet port and PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection P/N 36L9654.
15. A maximum quantity of one is supported.
16. Required for all xSeries and Netfinity servers containing a standard Advanced System Management Processor that is to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1xX...4xX are not supported). Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
17. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter), and a PC Card to 9-pin D-Shell cable which is routed to a rear chassis cut-out. The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together. To download the latest firmware access URL www.pc.ibm.com/us/netfinity. Select "Server Support", "Family", "Model", "Downloadable files", and finally "Advanced Systems Management".
18. PCI Wide Ultra160 SCSI Adapter P/N 19K4646 provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
19. Provides an ESCON MIC and a DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
20. A maximum of two ESCON adapters (installed in non-adjacent slots) are supported in a single server.
21. Where 'xx' represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.
22.Where 'xx' represents a country specific code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English. Country/Language - Line Cords/Publications are included as indicated
23.Where 'xx' represents a country specific code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English. Country/Language - Line Cords/Publications are included as indicated.

Slot 1- Bus A- 66 MHz- 3.3 V or Universal
Slot 2- Bus A- 66 MHz- 3.3 V or Universal
Slot 3- Bus B- 33 MHz- 5 V or Universal
Slot 4- Bus B- 33 MHz- 5 V or Universal
Slot 5- Bus B- 33 MHz- 5 V or Universal
Slot 6- Bus B- 33 MHz- 5 V or Universal
All Slots- Full Length, 64-bit

Netfinity 7100 Power, Monitors, Accessories

Part Number	Description
Power[1,9]	
33L37xx[10]	250 W Hot-Swap Redundant Power Supply[9]
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[9]
Uninterruptable Power Supply (UPS)[2]	
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
14RIxxx[12]	APC Smart-UPS 1400RMB[3]
30RIxxx[12]	APC Smart-UPS 3000RMB[3]
37L6862	APC Smart-UPS 5000RMB[4]
Monitors[5]	
T3347xx[11]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
31H2Nxx[11]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T32N3xx[11]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
T274Axx[11]	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[6]
11AG1xx[11]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[7]

1. Netfinity 7100 includes two 250W hot-swap redundant power supplies, with the ability to accept up to two additional 250 W Hot-Swap Redundant Power Supplies P/N 33L37xx. To assist in determining when an additional power supply is required to preserve redundancy, a "Non-Redundant LED" is a standard feature of the Netfinity 7100. Predicting whether or not a particular configuration will require an additional power supply for redundancy is very complex. However, once the system is installed, the "Non-Redundant LED" will indicate when an additional power supply is required. The following sample configuration is provided as a reference.

Power Supply Quan.	System Configuration Supported
Typical Non-Redundant Configuration	
	2 x Processors
2	3 x PCI Adapters
	4 x Half-High or 5 Slim-Line HDDs
	8 x 512 MB RDIMMs
Typical Redundant Configuration	
	4 x Processors
3[8]	6 x PCI Adapters
	7 x Half-High or 10 Slim-Line HDDs
	16 x 512 MB RDIMMs
4	Full Configuration with Redundancy

2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. Netfinity 7100 uses an SVGA controller (S3 Trio 3D chipset) with 4 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment P/N 94G7444.
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
8. The addition of a DLT tape drive may require a fourth power supply to preserve redundancy.
9. Rack Power Cable P/N 94G7448 (type C12) - one for each Power Supply, must be ordered for power connection to a high voltage UPS or PDU.
10. Where 'xx' refers to a country specific code: 60=Saudi Arabia, 61=Europe, 62=Denmark, 63=Israel, 64=Italy, 65=South Africa, 66=Switzerland, 67=United Kingdom&Arabia.
11. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
12. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe

Part Number	Description
Conversion Kits	
37L6860	8Ux24D Rack-to-Tower Kit[1]
37L6859	8Ux24D Tower-to-Rack Kit
Rack and NetBAY[2,10]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated door)
9306200	Netfinity NetBAY22
10L6912	Netfinity NetBAY3[3]
10L6913	Netfinity Caster Set
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit
94G7448	Rack Power Cable Type C12 (3.7m)[10]
Keyboard and Mouse[4]	
28L36xx[8]	Space Saver II Keyboard[5, 7]
28L36xx[9]	Preferred Keyboard (stealth black)[6]
28L3675	Sleek 2-Button Stealth Black Mouse

1. Includes one Netfinity NetBAY3 with casters.
2. Netfinity 7100 rack models are housed in a 19" rack mountable drawer and require one of the racks listed here. Tower models require Netfinity 8Ux24D Tower-to-Rack Kit P/N 37L6859 for installation in a rack.
3. Netfinity 7100 tower models require Netfinity 8Ux24D Rack-to-Tower Kit P/N 37L6860 for use with a NetBAY3. A maximum of three NetBAY3 enclosures, including the one which ships with the conversion kit, may be stacked beneath a supported Netfinity tower server. Optional NetBAY3s must be shipped separately and not while attached to the base configuration. See IBM Netfinity NetBAY3 Stackable Enclosure section for supported devices.
4. Tower models includes both a mouse and keyboard. Rack models include neither.
5. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
6. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
7. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
8. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
9. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
10. The Netfinity 7100 ships with a standard country power cord. For connection of a Rack model to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.

Netfinity 7100 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures[1]
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive[1]	1, 2	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25")HH	Y	N/A	10L7440, 03K8756[2]
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive[1]	1, 2	16	133 mm (5.25") HH	N	N/A	10L7440[3], 03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive[1]	1/2	16 Ultra2 LVD	133-mm (5.25") FH	N	N/A	03K8705[3] 03K8756[2]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive[1]	1, 2	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	10L7440[3], 03K8756[2]
	Tape Autoloaders						
00N79xx[10]	DLT Tape Autoloader	N/A	16	Desktop	Y	N/A	-
00N7992	120/240GB DDS/4 Tape Autoloader[1]	1/2	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[2]
	External Tape Libraries[4]						
00N79xx[11]	DLT Tape Library	-	16	Desktop or Rack	Y	-	-
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[5]	-	8/16	Desktop	N	N	-
03K8705	DLT External SCSI Enclosure[6]		16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[7]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[8]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	10L7440, 03K8705
10K2340	Media BayTray and LVD Cable Kit[2,9]	-	16 LVD	Int.	Y	N	-

Note: Netfinity 7100 includes an external 0.8-mm VHDCI connector.

1. Non-RAID Configurations require PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which contains a five-drop multi-mode terminated LVD SCSI cable. RAID configurations where the hot-swap backplane is cabled to a RAID controller, utilise the included two-drop multi-mode terminated LVD SCSI cable ito attach internal tapes to the onboard controller.
2. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit P/N 10K2340.
3. Requires 68-pin External Multimode LVD/SE SCSI terminator P/N 00N7956.
4. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
5. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
6. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator P/N 00N7956.
7. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
8. NetMEDIA Systems Management Adapter (P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
9. Media Bay Tray and LVD Cable Kit P/N 10K2340 includes an internal two-drop multi-mode terminated LVD SCSI cable.
10. Where 'xx' represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.
11. Where 'xx' represents a country specific power cord code: *Tower versions* - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: *Rack versions* - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

Netfinity 7100 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

High Availability Application Server

Part Number	Description	Quantity	Usage
641YMxx	Netfinity 7100 700/2 MB Xeon, 256 MB(R) ECC, Open, 40X, PCI	1	-
33L3067	Netfinity 64 MB, 100 MHz ECC SDRAM RDIMM	4	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	4	-
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM	4	2 GB Total System Memory
10K2332	Netfinity 700 MHz/2 MB Upgrade II with Pentium III Xeon Processor	2	Total of 3 SMP processors
37L7201	9.1 GB Wide Ultra160 SCSI Hot-Swap SL HDD	2	9.1 GB mirrored for NOS
37L7202	18.2 GB Wide Ultra160 SCSI Hot-Swap SL HDD	6	72 GB RAID 5 with hot-spare
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1	-
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	1	RAID 1 for NOS, RAID 5 for data
33L37xx	250 W Hot-Swap Redundant Power Supply	1	Full power redundancy
T274Axx	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black	1	
14RIxxx	APC Smart-UPS 1400	1	UPS

This tower server is configured to act as the foundation for business critical applications, applications your business cannot afford to be without. Configured with enough disk drives to mirror the operating system and provide a standard RAID 5 environment for data, optional hot-swap redundant power and UPS for power even during a blackout, this server represents the leading edge in high availability. An internal tape drive is included to back up that all important asset...data. A modem could be included to allow out-of-band (non-LAN) system management utilizing the integrated Netfinity Advanced System Management Processor.

Server Consolidation

Part Number	Description	Quantity	Usage
631YMxx	Netfinity 7100 700 MHz/1 MB Xeon, 256 MB(R) ECC, Open, 40X, PCI (Rack 8U)	1	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	4	768 MB Total System Memory
10K2331	Netfinity 700 MHz/1 MB Upgrade II with Pentium III Xeon Processor	1	Total of 2 SMP processors
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	2	9.1 GB mirrored for NOS
3L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	8	109 GB RAID 5 with hot-spare
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	1	RAID 1 for NOS, RAID 5 for data
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	2	Total of 3 Ethernet connections
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1	-
33L37xx	250 W Hot-Swap Redundant Power Supply	1	Full Power Redundancy
T274Axx	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black	1	-
14RIxxx	APC Smart-UPS 1400	1	UPS

This tower model is configured to meet the need of server consolidation. Many businesses are trying to get their arms around the dispersed departmental servers that have grown up around the enterprise. By moving multiple servers onto one platform there is only one system to manage, both hardware and software. There is potentially less expense for service, software licenses, etc., and there is no need to worry about putting all your eggs in one basket because the Netfinity 7100 is designed for high availability. This configuration includes 109 GB of internal HDD storage, features a third power supply which provides fully redundant power, a UPS to help protect the system against a momentary electricity loss, and an internal tape drive that backs up, up to 80 GB per tape...in addition to all the standard features of the Netfinity 7100.

IBM Netfinity 7600 Configurator

Part Number*	Withdrawal Date:ddmmyy[8]	Processor Speed (MHz)[2]	Number of Processors (Std./Max)	L2 ECC Cache (KB)	Memory (Std./Max) (R=RDIMM)[3]	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap (Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor	Onboard Ethernet (Mbps)	SCSI Controller (Dual, Ultra, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk Drive (Std./Max)	CD-ROM (IDE)[7]	Bays: (Tot/Av)	Slots:(T/A)
51RYExx[1]	24/10/00	550	1/4	1024	512MB(R)/16GB	Rack(8U)	3/4	P, S, H,F	S-Fans S-Power[4]	Y	10/100	D,U2,R[5]	4/2	0/364GB	40X-17X	14/12	6/5
52RYExx[1]	24/10/00	550	1/4	2048	512MB(R)/16GB	Rack(8U)	3/4	P, S, H,F	S-Fans S-Power[4]	Y	10/100	D,U2,R[5]	4/2	0/364GB	40X-17X	14/12	6/5
53RYExx[1]	-	700	1/4	2048	512MB(R)/16GB	Rack(8U)	3/4	P, S, H,F	S-Fans S-Power[4]	Y	10/100	D,U2,R[5]	4/2	0/364GB	40X-17X	14/12	6/5
K54RYxx[1]	-	700	1/4	1024	512MB(R)/16GB	Rack(8U)	3/4	P, S, H,F	S-Fans S-Power[4]	Y	10/100	D,U2,R[6]	4/2	0/364GB	40X-17X	14/12	6/5
K55RYxx[1]	-	700	1/4	2048	512MB(R)/16GB	Rack(8U)	3/4	P, S, H,F	S-Fans S-Power[4]	Y	10/100	D,U2,R[6]	4/2	0/364GB	40X-17X	14/12	6/5

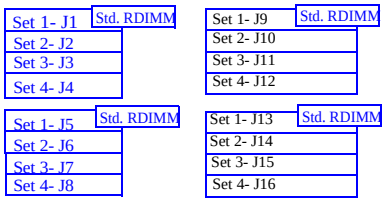
* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance.
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Netfinity 7600 Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III Xeon processor with advanced transfer (full speed) L2 cache and 100 MHz access to memory and I/O buses.
3. Advanced Chipkill ECC memory - corrects two-bit, three-bit, and four-bit memory errors.
4. Robust configurations may require optional Netfinity 250 W Hot-Swap Redundant Power Supply P/N 33L37xx for redundancy. See "Power" under Netfinity 7600 Power, Monitor & Accessories" for additional information.
5. RAID adapter is equivalent to Netfinity ServeRAID-3HB Ultra2 SCSI Adapter P/N 37L6086.
6. RAID adapter is equivalent to ServeRAID-4M Ultra160 SCSI Controller P/N 37L6080.
7. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
8. Not available from IBM after this date. Business Partner inventory may be available.

Netfinity 7600 Processor Upgrades

Part Number	Processor Upgrades with Full Speed Cache	SMP Support[1]	Processor Speed Upgrade[2]
33L5057	Netfinity 550 MHz/1 MB Upgrade II with Pentium III Xeon Processor	1RY	-
33L5058	Netfinity 550 MHz/2 MB Upgrade II with Pentium III Xeon Processor	2RY	1RY
10K2331	Netfinity 700 MHz/1 MB Upgrade II with Pentium III Xeon Processor	-	1RY, 2RY
10K2332	Netfinity 700 MHz/2 MB Upgrade II with Pentium III Xeon Processor	3RY	1RY, 2RY

1. Three additional processors may be installed, providing a maximum of four. All processors must be identical in type, speed, and cache size.
2. Requires removal of the standard processor. A maximum of four processors may be installed. All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".

Netfinity 7600 Memory Configurator



All RDIMMs installed in each set must be the same size , but all the sets do not have to contain RDIMMs of the same size . Install RDIMM sets in numerical sequence from 1 to 4.

Total Memory[1]	Quantity of RDIMMs Added[2]			
	128 MB (P/N 33L3113)	256 MB (P/N 33L3115)	512 MB (P/N 33L3117)	1 GB (P/N 33L3119)
512 MB	4 x 128 RDIMMs standard	-	-	-
1.0 GB	4	-	-	-
1.5 GB	-	4	-	-
2.0 GB	4	4	-	-
2.5 GB	-	8	-	-
3.0 GB	4	-	4	-
4 GB	4	4	4	-
5 GB	4	-	8	-
6 GB[3]	-	8	8	-
7 GB[3]	-	4	12	-
8 GB[3]	-	-	16	-
9 GB	4	-	-	8
10 GB[3]	-	-	12	4
12 GB[3]	-	-	8	8
14 GB[3]	-	-	4	12
16 GB[3] (max)	-	-	-	16

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.
1. Network Operating Systems may limit the maximum amount of addressable memory. See operating system specifications for further information.
2. To obtain the Quantity of memory identified in the “Total Memory” column, select the appropriate row and order the quantity of RDIMMs identified in all columns for that row. Example: For 2.0 GB, order 4 x 33L3113 plus 4 x 33l3115.
3. Requires removal of standard RDIMMs.

Part Number	Memory Description[1]
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM
33L3117	Netfinity 512 MB, 100 MHz ECC SDRAM RDIMM
33L3119	Netfinity 1 GB 100 MHz ECC SDRAM RDIMM

1. Due to four-way interleaving all RDIMMs installed in each set must be the same size, but all the sets do not have to contain RDIMMs of the same size. Install RDIMM sets in numerical sequence from 1 to 4. Chipkill support is provided on the memory card.

Netfinity 7600 Internal Hard Disk Drive Configurator

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 37L7201)[2]	18.2 GB (P/N 37L7202)[2]	36.4 GB (P/N 37L7203)[2]	9.1 GB (P/N 37L7204)[2]	18.2 GB (P/N 37L7205)[2]	36.4 GB (P/N 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4	2	1	4	2	1
45.5 GB	5	-	-	5	-	-
54.6 GB	6	3	-	6	3	-
63.7GB	7	-	-	7	-	-
72.8 GB	8	4	2	8	4	2
81.9GB	9	-	-	9	-	-
91 GB	10	5	-	10	5	-
109.2 GB	-	6	3	-	6	3
127.4GB	-	7	-	-	7	-
145.6GB	-	8	4	-	8	4
163.8GB	-	9	-	-	9	-
182GB	-	10	5	-	10	5
218.4GB	-	-	6	-	-	6
254.8GB	-	-	7	-	-	7
291.2 GB	-	-	8	-	-	8
327.6 GB	-	-	9	-	-	9
364 GB (max)	-	-	10	-	-	10

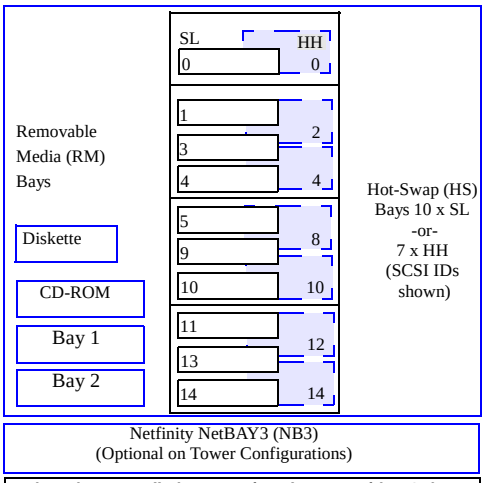
This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.
2. Netfinity 7600 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.

Bay	Form Factor	Height	Front Access	Usage
-	89 mm (3.5”)	SL	Yes	Diskette
-	133 mm (5.25”)	HH	Yes	IDE CD-ROM
RM 1	133 mm (5.25”)	HH[1]	Yes	Open
RM 2	133 mm (5.25”)	HH[1]	Yes	Open
1...10 or 1...7	HS	SL or HH[2]	Yes	Open
NB3[3]	19” Rack	3U	Yes	Open

1. Two half-high (HH) bays can be combined to support a single full-high (FH) device
2. The top bay is HH; all others are configured in groups of 3 SL bays. When a HH drive is installed in one of these groups, only another HH or a single SL drive can be installed in the same group. For clarity, the SCSI IDs are identified.
3. Tower configured systems (Netfinity 8Ux24D Rack-to-Tower Kit, P/N 37L6860 is required and includes a single NetBAY3) support installation of up to three NetBAY3s. See IBM Netfinity NetBAY3 Stackable Enclosure section for supported devices.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
Ultra160 Hard Disk Drives (HDD)[1]					
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	See diagram	10
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	See diagram	10

19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	See diagram	10
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	See diagram	10
External Storage Expansion Units[2]		**Form Factor**			
00N6xxx[7]	Netfinity EXP200 Storage Expansion Unit[3, 6]	Rack (3U)			
37L5857	Netfiinity EXP200 Rack-to-Tower Conversion Kit	-			
37L0xxx[8]	Netfinity EXP200 350 W Redundant Power Supply[6]	-			
19K11xx[9]	EXP300 Storage Expansion Unit[4, 6]	Rack (3U)			
09N7296	EXP300 Rack-to-Tower Conversion Kit	-			
00N71xx[10]	FAStT EXP500 Storage Expansion Unit[5, 6]	Rack (3U)			
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[6]	-			



1. The top bay is HH; all others are configured in groups of three SL bays. When a HH drive is installed in one of these groups, only another HH or a single SL drive can be installed in the same group. For clarity, the SCSI IDs are identified.

1. Netfinity 7600 contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
3. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply. Optional hot-swap Netfinity EXP200 350W Power Supply P/N 37L0xxx provides redundancy. To convert an EXP200 to a tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit P/N 37L5857 is required.
4. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500 W power supplies. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit P/N 09N7296 is required.
5. FAStT EXP500 Storage Expansion Unit includes dual hot-swap 350 W power supplies.
6. These units do not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order Rack Power Cables according to the number of power supplies.
7. Where 'xxx' represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English:- Line Cords/ Publication Country Kits are included throughout.
8. Where 'xxx' represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.
9.Where 'xx' represents a specific country code: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included throughout.
10. Where 'xx' represents a country specific code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English. Country/ Language Line Cords/Publications are included as indicated.

Internal SCSI Cabling

The Netfinity 7600 contains a DASD backplane supporting ten hot-swap, SCA-2 compliant drive bays. The backplane is connected to the internal connector of the standard Netfinity ServeRAID-3HB Ultra2 SCSI Adapter through a 16-bit LVD SCSI cable. External RAID support is provided through the two external 0.8-mm VHDCI connectors on the back of the adapter. To support SCSI devices in the internal 133/89-mm (5.25/3.5-inch) half-high bays, a two-drop, 16-bit LVD SCSI cable with integrated terminator is included with the server. This cable can be used to connect Channel B of the integrated Wide Ultra2 SCSI controller to SCSI devices in one or both of the removable media bays. Channel A, of the dual-channel, Wide Ultra2 SCSI controller, only supports external SCSI attachment and is cabled directly to an external 0.8-mm VHDCI SCSI connector.

Netfinity 7600 I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]	Hot-Plug[2]	PCI Voltage Key	MHz
	Storage Controllers[3]						
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[4]	Full	32/64-bit	3...6	X	5	33
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	3...6	-	5	33
37L6080	Netfinity ServeRAID-4M Ultra160 SCSI Controller[5]	Full	32/64-bit	1...6	X	Universal	33
37L6889	Netfinity ServeRAID-4H Ultra160 SCSI Controller[6]	Full	32/64-bit	1...6	X	Universal	33
19K4646	PCI Wide Ultra160 SCSI Adapter[16]	Half	32/64-bit	1...6	-	Universal	66
	Fibre Storage Controller[7]						
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...6	X	Universal	66
19K11xx[20]	FAStT200 Storage Server	-	-	-	-	-	-
19K11xx[21]	FAStT200 HA Storage Server	-	-	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-	-	-	-
	Networking[8]						
	Ethernet						
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...6	X	Universal	33
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...6	X	Universal	33
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1...6	X	Universal	33
	Token Ring						
34L5001	16/4 Token-Ring PCI Management Adapter[9]	Half	32-bit	1...6	X	Universal	33
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[9]	Half	32-bit	1...6	X	Universal	33
34L5201	High speed 100/16/4 Token Ring PCI Management Adapter	Half	32-bit	1...6	X	Universal	33
	Communications[10]						
	Systems Management[11]						
36L96xx[19]	Netfinity Advanced System Management PCI Adapter[12, 13]	Full	32-bit	3...6[13]	-	5	33
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[14]	-	-	-	-	-	-
36L9654	Netfinity Advanced System Management Token-RIng Connection[15]	-	-	-	-	-	-
	Host Attach						
10L7368	Netfinity ESCON Adapter[17,18]	Full	32-bit	3...6[18]	-	5	33

1.The 5 V slots support Universal or 5 V adapters. The 3.3 V slots support universal or 3.3 V adapters. A Universal keyed 66 MHz adapter plugged into a 33 MHz slot will operate at 33 MHz. A Universal keyed 33 MHz adapter plugged into a 66 MHz slot limits other adapters installed on the same bus to 33 MHz.
2. Slots 3-6 include hot-plug capability using IBM's Active PCI technology.
3. Models P/N 51RYExx, 52RYExx and 53RYExx include a single ServeRAID-3HB Ultra2 SCSI controller as standard. Models P/N K54RYxx and K55RYxx include a single ServeRAID-4M Ultra160 controller. One channel of these adapters is attached to the internal hot-swap backplane. Remaining channels are available for external usage just as the option would be. All models include a dual-port, dual-channel, 64-bit Wide Ultra2 SCSI controller with one internal connector and one external port with a 0.8-mm Very High Density Connection Interface (VHDCI).
4. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter P/N 37L6086 provides one internal and 2 external (0.8-mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8-mm VHDCI connector) providing a total of 3 external LVDS SCSI channels. Includes 32MB of mirrored battery-backup cache which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
5. Netfinity ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilized). External connectors are 0.8-mm VHDCI.
6. Netfinity ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilized). External connectors are 0.8-mm VHDCI.
7. See Fibre Array Solutions section for additional configuration information.
8. Netfinity 7600 includes a full-duplex, 10/100 Mbps Ethernet PCI Controller.
9. The Wake on LAN function of this option is not supported by Netfinity servers.
10. Netfinity 7600 includes two USB ports, two high-speed serial/asynchronous ports (NS16550A compatible), and one high-speed (up to 2 MB/sec. data transfer speed) bi-directional parallel port supporting devices using ECP/EPP/SSP protocols adhering to the IEEE 1284 standard.
11. The Netfinity Advanced Systems Management Processor and Interconnect Bus integrated into Netfinity 7600 works with Netfinity Director to provide significant system management function. When used with optional Netfinity Advanced System Management PCI Adapter P/N 36L96xx and Netfinity Advanced System Management Interconnect Cable Kit P/N 03K9309 additional management and control of up to 12 service processors from a remote console through a single modem or LAN connection is possible.
12. Includes PCI adapter, Netfinity Advanced System Management Interconnect Cable Kit components and 56-watt AC adapter which requires a separate power source. Provides an integrated 10/100 Ethernet port and PCMCIA slot to support optional Netfinity Advanced System Management Token-Ring Connection P/N 36L9654.
13. A maximum quantity of one is supported.
14. Required for all xSeries and Netfinity servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1...4xX are not supported). Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft.). A customer-supplied Ethernet cable is required for each interconnection.
15. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter, and a PC Card to 9-pin D-Shell cable which is routed to a rear chassis cut-out. The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together. To download the latest firmware access URL www.pc.ibm.com/us/netfinity. Select "Server Support", "Family", "Model", "Downloadable files", and finally "Advanced Systems Management".
16. PCI Wide Ultra160 SCSI Adapter P/N 19K4646 provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
17. Provides an ESCON MIC and a DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
18. A maximum of two ESCON adapters (installed in non-adjacent slots) are supported in a single server.
19. Where 'xx' represents a country specific code: 57=Denmark, 58=South Africa/India, 59=UK, 60=Switzerland, 61=Italy, 62=Israel, 01K7310=Europe, 01K7209=US/Saudi Arabia.
20.Where 'xx' represents a country specific code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English. Country/Language - Line Cords/Publications are included as indicated
21.Where 'xx' represents a country specific code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English. Country/Language - Line Cords/Publications are included as indicated.

Netfinity 7600 Power, Monitors, Accessories

Part Number	Description
Power[1,9]	
33L37xx[10]	250 W Hot-Swap Redundant Power Supply[9]
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[9]
Uninterruptable Power Supply (UPS)[2]	
SUP102Y	APC Smart-UPS 1000
SUP142Y	APC Smart-UPS 1400
14RIxxx[12]	APC Smart-UPS 1400RMB[3]
30RIxxx[12]	APC Smart-UPS 3000RMB[3]
37L6862	APC Smart-UPS 5000RMB[4]
Monitors[5]	
T3347xx[11]	E51 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
31H2Nxx[11]	E54 Color Monitor 15" (350-mm, 13.8" Viewable Image Size), stealth black[6]
T32N3xx[11]	E74 Color Monitor 17" (403-mm, 15.9" Viewable Image Size), stealth black[6]
T274Axx[11]	G78 Color Monitor 17" (454-mm, 17.9" Viewable Image Size), stealth black[6]
11AG1xx[11]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0" Viewable), stealth black[7]

Part Number	Description
Conversion Kits	
37L6860	8Ux24D Rack-to-Tower Kit[1]
Rack and NetBAY[2,10]	
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack
9306910	Netfinity Rack (includes perforated door)
9306200	Netfinity NetBAY22
10L6912	Netfinity NetBAY3[3]
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit
94G7448	Rack Power Cable Type C12 (3.7m)[10]
Keyboard and Mouse[4]	
28L36xx[8]	Space Saver II Keyboard[5, 7]
28L36xx[9]	Preferred Keyboard (stealth black)[6]
28L3675	Sleek 2-Button Stealth Black Mouse

1. Netfinity 7600 includes three 250W hot-swap redundant power supplies, with the ability to accept one additional 250 W Hot-Swap Redundant Power Supply P/N 33L37xx. To assist in determining when an additional power supply is required to preserve redundancy, a "Non-Redundant LED" is a standard feature of the Netfinity 7600. Predicting whether or not a particular configuration will require an additional power supply for redundancy is very complex. However, once the system is installed, the"Non-Redundant LED" will indicate when an additional power supply is required. The following sample configuration is provided as a reference.

Number of Power Supplies	System Configuration Supported
	Typical Redundant Configuration
	4 x Processors
3[8]	6 x PCI Adapters
	7 x Half-High or 10 Slim-Line HDDs
	16 x 512 MB RDIMMs
4	**Full Configuration with Redundancy**

2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimate.
3. Height is 3U. See "Rack and NetBAY" for supported IBM racks.
4. Height is 5U. See "Rack and NetBAY" for supported IBM racks.
5. Netfinity 7600 uses an SVGA controller (S3 Trio 3D chipset) with 4 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment P/N 94G7444.
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
8. The addition of a DLT tape drive may require a 4th power supply to preserve redundancy.
9. Rack Power Cable P/N 94G7448 (type C12 - one for each Power Supply), must be ordered for power connection to a high voltage UPS or PDU.
10. Where 'xx' refers to a country specific code: 60=Saudi Arabia, 61=Europe, 62=Denmark, 63=Israel, 64=Italy, 65=South Africa, 66=Switzerland, 67=United Kingdom&Arabia.
11. Where 'xx' represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
12. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

1. Includes one Netfinity NetBAY3 with casters.
2. Netfinity 7600 rack models are housed in a 19" rack mountable drawer and require one of the racks listed here. See IBM Netfinity Rack Cabinet and Options section for IBM rack supported devices.
3. Netfinity 7600 requires 8Ux24D Rack-to-Tower Kit (P/N 37L6860) for use with a NetBAY3. A maximum of three NetBAY3 enclosures, including the one which ships with the conversion kit, may be stacked beneath a supported Netfinity tower server. Optional NetBAY3s must be shipped separately and not while attached to the base configuration. See IBM Netfinity NetBAY3 Stackable Enclosure section for supported devices.
4. Netfinity 7600 ships without a keyboard or mouse.
5. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in "ready-to-use" position).
6. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
7. Advanced TrackPoint IV features are not available on IBM Netfinity systems.
8. Where 'xx' represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19L3834=Belgium, 19K3836=Russia, 19K3837=Poland.
9. Where 'xx' represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
10. The Netfinity 7600 ships with a standard country power cord. For connection of a Rack model to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.

Netfinity 7600 Tape Options

Part Number	Tape Drives	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Enclosures[1]
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	1, 2	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	10L7440, 03K8756[1]
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	1, 2	16	133 mm (5.25") HH	N	N/A	10L7440[2], 03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1/2	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8705[2], 03K8756[1]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	1, 2	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	10L7440[2], 03K8756[1]
	Tape Autoloaders						
00N79xx[9]	DLT Tape Autoloader	N/A	16	Desktop	Y	N/A	-
00N7992	120/240GB DOS/4 Tape Autoloader	1/2	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[1]
	External Tape Libraries[3]						
00N79xx[10]	DLT Tape Library	-	16	Desktop or Rack	Y	-	-
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[4]	-	8/16	Desktop	N	N	-
03K8705	DLT External SCSI Enclosure[5]		16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[6]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[7]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	10L7440, 03K8705
10K2340	Media BayTray and LVD Cable Kit[1,8]	-	16 LVD	Int.	Y	N	-

Note: Netfinity 7600 includes a two-drop multimode terminated LVD SCSI cable, an available internal Ultra2 SCSI port and an external Ultra2 0.8-mm VHDCI connector.

1. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit P/N 10K2340.
2. Requires 68-pin External Multimode LVD/SE SCSI terminator P/N 00N7956.
3. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
4. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
5. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator P/N 00N7956.
6. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
7. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
8. Media Bay Tray and LVD Cable Kit P/N 10K2340 includes an internal two-drop multi-mode terminated LVD SCSI cable.
9. Where 'xx' represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.
10. Where 'xx' represents a country specific power cord code: *Rack versions* - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

Netfinity 7600 Sample Configurations

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

High Availability Application Server

Part Number	Description	Quantity	Usage
53RYExx	Netfinity 7600 700/2 MB Xeon, 512 MB(R) ECC,RAID, Open, 40X, PCI (Rack 8U)	1	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	4	-
33L3115	Netfinity 256 MB, 100 MHz ECC SDRAM RDIMM	4	-
33L3117	Netfinity 512 MB, 100 MHz ECC SDRAM RDIMM	4	4 GB Total System Memory
10K2332	Netfinity 700 MHz/2 MB Upgrade II with Pentium III Xeon Processor	3	Total of 4 SMP processors
37L7201	9.1 GB Wide Ultra160 SCSI Hot-Swap SL HDD	2	9.1 GB mirrored for NOS
37L7202	18.2 GB Wide Ultra160 SCSI Hot-Swap SL HDD	6	72 GB RAID 5 with Hot-Spare
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1	-
33L37xx	250 W Hot-Swap Redundant Power Supply	1	Full Power Redundancy
T274Axx	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black	1	-
28L36xx	Space Saver II Keyboard	1	-
14RIxxx	APC Smart-UPS 1400RMB	1	-
External Storage			
00N6xxx	Netfinity EXP200 Storage Expansion Unit	1	Includes 2-m Ultra2 cable
37L0xxx	Netfinity EXP200 350 W Redundant Power Supply	1	-
36L9750	Netfinity 36.4 GB 10K-3 Wide Ultra2 SCSI Hot-Swap HDD	10	RAID 5 Data Storage with Hot-Spare
Rack			
9306200	Netfinity NetBAY22	1	
28L0542	Netfinity Console Server Selector Switch (4-port)	1	
94G7448	Power Cable - Type C12	1	
94G7447	12ft Console Cable Set	1	
94G6670	Blank Filler Panel Kit	1	

This rack server is configured to act as the foundation for business critical applications, applications your business cannot afford to be without. Configured with enough disk drives to mirror the operating system and provide a standard RAID 5 environment for data, optional hot-swap redundant power and UPS for power even during a blackout, this server represents the leading edge in high availability. An internal tape drive is included to back up that all important asset...data. A modem could be included to allow out-of-band (non-LAN) system management utilizing the integrated Netfinity Advanced System Management Processor.

Server Consolidation

Part Number	Description	Quantity	Usage
53RYExx	Netfinity 7600 700/2 MB Xeon, 512 MB(R) ECC, RAID, Open, 40X, PCI (Rack 8U)	1	-
33L3113	Netfinity 128 MB, 100 MHz ECC SDRAM RDIMM	4	1 GB Total System Memory
10K2332	Netfinity 700 MHz/2 MB Upgrade II with Pentium III Xeon Processor	1	Total of 2 SMP processors
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	2	9.1 GB mirrored for NOS
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	8	109 GB RAID 5 with Hot-Spare
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	3	Total of 4 Ethernet connections
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1	-
T274Axx	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black	1	-
28L36xx	Space Saver II Keyboard	1	-
14RIxxx	APC Smart-UPS 1400RMB	1	-
Rack			
9306200	Netfinity NetBAY22	1	-
28L0542	Netfinity Console Server Selector Switch (4-port)	1	-
94G7448	Power Cable - Type C12	1	Attaches to monitor
94G7447	12ft Console Cable Set	1	-
94G6670	Blank Filler Panel Kit	2	-

This rack server is configured to meet the need of server consolidation. Many businesses are trying to get their arms around the dispersed departmental servers that have grown up around the enterprise. By moving multiple servers on to one platform there is only one system to manage, both hardware and software. There is potentially less expense for service, software licenses, etc., and there is no need to worry about putting all your eggs in one basket because the Netfinity 7600 is designed for high availability. This configuration includes 109 GB of internal HDD storage, features three power supplies which provide fully redundant power, a UPS to help protect the system against a momentary electricity loss, and an internal tape drive that backs up, up to 80 GB per tape...in addition to all the standard features of the Netfinity 7600.

IBM Netfinity 8500R Configurator

Part Number*	Withdrawal Date: ddmmyy[5]	Processor Speed (MHz)[2]	Number of Proc.(Std./Max)	L2 ECC Cache (KB)	Memory (Std/Max)R=RDIMM	Form Factor	Power Supply Quantity (Std./Max)	Hot-Swap(Power, Slots, HDD, Fans)	Redundancy (Optional, Standard)	Adv. System Management Processor[3]	Onboard Ethernet	SCSI Controller(Dual, Ultra2, RAID)	Removable Media Bays (Total/Avail)	Internal Hard Disk (Std./Max)	CD-ROM(IDE)[4]	Bays (Total/Avail)	Slots (T/A)
15RYNxx[1]	24/10/00	550	1/8	1024	512 MB[R]/32 GB	Rack (8U)	3/3	P, S, H, F	S-Fans, S-Power	Y	-	D, U2	2/0	0/72.8 GB	40X-17X	4/2	12/12
16RYNxx[1]	24/10/00	550	1/8	2048	512 MB[R]/32 GB	Rack (8U)	3/3	P, S, H, F	S-Fans, S-Power	Y	-	D, U2	2/0	0/72.8 GB	40X-17X	4/2	12/12
17RYNxx[1]	-	700	1/8	1024	512 MB[R]/32 GB	Rack (8U)	3/3	P, S, H, F	S-Fans, S-Power	Y	-	D, U2	2/0	0/72.8 GB	40X-17X	4/2	12/12
18RYNxx[1]	-	700	1/8	2048	512 MB[R]/32 GB	Rack (8U)	3/3	P, S, H, F	S-Fans, S-Power	Y	-	D, U2	2/0	0/72.8 GB	40X-17X	4/2	12/12

* For IBM ServicePacs see Appendix F: IBM ServicePacs for Hardware Maintenance.
1. Housed in a 19" Rack mountable drawer and ships standard without a keyboard or mouse. See "Rack and NetBAY" under "Netfinity 8500R Power, Monitor & Accessories" for supported IBM racks.
2. Intel Pentium III Xeon processor.
3. Netfinity 8500R includes a systems management adapter equivalent to the one shipped with Netfinity Advanced System Management PCI Adapter P/N 36L96xx (Advanced System Management PCI Adapter).
4. Variable read rate. Actual playback speed will vary and is often less than the maximum possible.
5. Not available from IBM after this date. Business Partner inventory may be available.

Netfinity 8500R Processor Upgrades

Part Number	Processor Upgrades with 512 KB, 1 MB or 2 MB Cache[1]	SMP Support[2]	Processor Speed/Cache Upgrade[3]
33L5104	Netfinity 8500R 550 MHz/1 MB Upgrade with Pentium III Xeon Processor	5RY	4RY
33L5105	Netfinity 8500R 550 MHz, 2 MB Upgrade with Pentium III Xeon Processor	6RY	4...5RY
28L4730	Netfinity 8500R>4-Way Enablement Kit (1X SRAM)[5]	4...6RY[4]	4...6RY
28L4727	Netfinity 8500R>4-Way Enablement Kit (4X SRAM)[5]	4...6RY[4]	4...6RY
10K2330	Netfinity 8500R 700 MHz/1 MB Upgrade with Pentium III Xeon Processor[3]	7RY	4...6RY[5]
10K2166	Netfinity 8500R 700 MHz, 2 MB Upgrade with Pentium III Xeon Processor[3]	8RY	4...7RY[5]
10K2335	Netfinity 4X Accelerator Filter	7...8RY[4]	4...7RY
10K2337	Netfinity Mezzanine Expansion Kit	7...8RY[4]	4...7RY

1. Netfinity 8500R architecture optimises memory and bus performance using a 100 MHz, five-port crossbar core chipset. Up to eight Pentium III Xeon processors are supported on two 100 MHz P-6 CPU buses. The recommended order of processor installation is: Sockets A1, A3, A2, A4, B1, B3, B2, B4.
2. Up to seven additional processors may be installed, providing a maximum of eight. All processors must be identical in type, speed, and cache size.
3. Requires removal of the standard processor(s). A maximum of eight processors may be installed. Installation of greater than four processors requires the addition of a mezzanine board and two cache coherency filters. Required options which provide the board and filters vary by model. For more information refer to "Processor Upgrade Requirements". All processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" and then "BIOS".
4. See "Processor Upgrade Requirements" to determine when this option is required.
5. Replacement of the standard processor mezzanine board and the mezzanine board from any installed enablement kit of 550 MHz models is required. See "Processor Upgrade Requirements" to determine specific model upgrade requirements.

	Processor Upgrade Requirements[1,2]			
	Upgrade To			
Upgrade From	≤ 4 x 550 MHz processors	> 4 x 550 MHz processors	≤ 4 x 700 MHz processors	> 4 x 700 MHz processors
≤ 4 x 550 MHz processors	-	1 x 28L4730 or 1 x 28L4727	1 x 10K2337[3]	1 x 10K2335, 2 x 10K2337[3]
> 4 x 550 MHz processors	n/a	-	1 x 10K2337[3, 4]	2 x 10K2337[3, 5]
≤ 4 x 700 MHz processors	n/a	n/a	-	1 x 10K2335, 1 x 10K2337

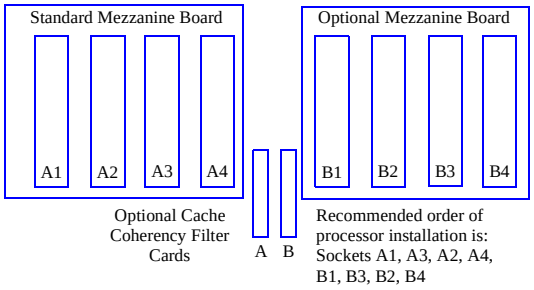
1. This table does not address the processor part numbers required. It does address the optional Enablement Kit, Filters, and Mezzanine Board part numbers required.
2. All processors must be identical in type, speed, and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine "Type-Model" in Quick Path. Select "Downloadable files" then "BIOS".
3. Remove the standard processor mezzanine board.
4. Remove all optional Enablement Kit components.
5. Remove Enablement Kit mezzanine board. The Enablement Kit 4X cache coherency filters are supported for use with Netfinity Mezzanine Expansion Kit P/N 10K2337.

Netfinity 8500R ships with a single mezzanine board containing four Pentium III Xeon processor sockets with terminators in the unoccupied sockets. An additional mezzanine board may be added, expanding the number of processor sockets to eight. The two mezzanine boards are then linked through two cache coherency filter cards, one for each mezzanine board.

Option Content

Netfinity 8500R > 4-Way Enablement Kits (P/N 28L4730 and P/N 28L4727)

- Support for 550 MHz models only
- Required for installation of processors 5...8.
- One Processor Mezzanine Board
- Two cache coherency filter modules
  - 28L4730 economical 1X (256 K entries)
  - 28L4727 high performance 4X (1 M entries)
  - Filters may be used with Mezzanine Expansion Kit (P/N 10K2337)



Optional Cache Coherency Filter Cards

Recommended order of processor installation is: Sockets A1, A3, A2, A4, B1, B3, B2, B4

Netfinity 4X Accelerator Filter (P/N 10K2335)

- Two cache coherency filter modules
- Requires Mezzanine Kit 10K2337

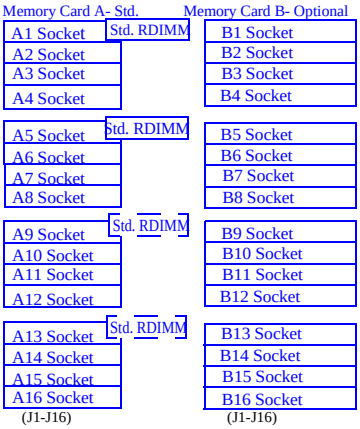
Netfinity Mezzanine Expansion Kit (P/N 10K2337)

- One Processor Mezzanine Board
- Supports cache coherency filters from the following options:
  - P/N 10K2335
  - P/N 28L4730
  - P/N 28L4727
- Supports 700 MHz and above processors only
- Required when upgrading models 8681-4RY...6RY to 700 MHz or above

All installed processors must be identical in type, speed and cache size. Upgrades may require a BIOS update. To obtain the latest Flash BIOS, access www.ibm.com/pc/support and enter machine “Type-Model” in Quick Path. Select “Downloadable files” then “BIOS”.

Netfinity 8500R Memory Configurator

Total System Memory[1]		Quantity of RDIMMs Added			
Standard Models					
256 MB (2 x 128)	512 MB (4 x 128)	128 MB (P/N 20L0245)	256 MB (P/N 20L0247)	512 MB (P/N 20L0249)	1 GB (P/N 33L3056)
384	640	1	-	-	-
512	768	2 or	1	-	-
768	1024	4 or	2 or	1	-
1024	1280	6 or	3	-	-
1280	1536	8 or	4 or	2 or	1
1536	1792	10 or	5	-	-
1792	2048	12 or	6 or	3	-
2304	2560	16[2] or	8 or	4 or	2
2560	2816	18[2] or	9	-	-
2816	3072	20[2] or	10 or	5	-
3072	3328	22[2] or	11	-	-
3328	3584	24[2] or	12 or	6 or	3
3840	4096	28[2] or	14[4] or	7	-
4096	-	30[2] or	16[3]	-	-
4352	4608	-	16[2] or	8 or	4
4864	5120	-	18[2] or	9	-
5376	5632	-	20[2] or	10 or	5
5888	6144	-	22[2] or	11	-
6400	6656	-	24[2] or	12 or	6
7424	7680	-	28[2] or	14[4] or	7
8192	8192	-	32[2, 3] or	16[3]or	8[3]
8448	8704	-	-	16[2] or	8
9472	9728	-	-	18[2] or	9
10496	10752	-	-	20[2] or	10
11520	11776	-	-	22[2] or	11
12544	12800	-	-	24[2] or	12
13568	13824	-	-	26[2] or	13
14592	14848	-	-	28[2] or	14[4]
15488	15488	-	-	-	15[6]
16384	16384	-	-	32[2, 3]	16[3]
16640	16896	-	-	-	16[2]
18688	18944	-	-	-	18[2]
20736	20992	-	-	-	20[2]
22784	23040	-	-	-	22[2]
24832	25088	-	-	-	24[2]
26880	27136	-	-	-	26[2]
28928	29184	-	-	-	28[2]
30720	30720	-	-	-	30[5]
32768	32768	-	-	-	32[3]



Recommended order of RDIMM population for optimum cooling: 1, 5, 9, 13, 3, 7, 11, 15, 2, 6, 10, 14, 4, 8, 12, 16.

This table does not represent all possible memory configurations. Memory modules may vary in price per MB. Selection of smaller RDIMMs may provide a more cost-effective alternative to using larger RDIMMs.

NOTE: Cache line interleaving may be enabled by installing Netfinity 8500R Memory Expansion Card P/N 28L4454 with as few as two RDIMMs. Matched pairs must be installed if the memory expansion card is present.

1. Network Operating Systems may limit the maximum amount of addressable memory. See the operating system specifications for further information.
2. Netfinity 8500R Memory Expansion Card (P/N 28L4454) is required for installation of greater than 16 RDIMMs.
3. Requires removal of standard memory.
4. Models with 4 x 128 RDIMMs standard require Netfinity 8500R Memory Expansion Card (P/N 28L4454) for installation of greater than 16 RDIMMs.
5. Requires removal of all but two of the standard RDIMMs.
6. Requires removal of all but one of the standard RDIMMs.

Part Number	Memory Description[1]
20L0245	Netfinity 128 MB SDRAM ECC RDIMM II
20L0247	Netfinity 256 MB SDRAM ECC RDIMM II
20L0249	Netfinity 512 MB SDRAM ECC RDIMM II
28L4454	Netfinity 8500R Memory Expansion Card[2]
33L3056	Netfinity 1 GB SDRAM ECC RDIMM II

1. Netfinity 8500R includes a single memory card with the ability to support up to 16 GB of memory. Model 14RYNxx contains two RDIMMs standard, other models contain four. For memory installation of greater than 16 GB, Netfinity 8500R Memory Expansion Card (P/N 28L4454) is required. Installation of memory on systems containing a single memory card (standard on all models) has no restrictions on size or placement. When Netfinity 8500R Memory Expansion Card (P/N 28L4454) is installed, the memory RDIMM in each socket of Card A must match the RDIMM in the same socket on Card B. To enable cache line interleaving, both memory cards must be installed and configured identically.
2. Required for enablement of cache line interleaving or installation of greater than 16 RDIMMs. Configuration of the standard memory card (Card A) and optional 28L4454 (Card B) must be identical.

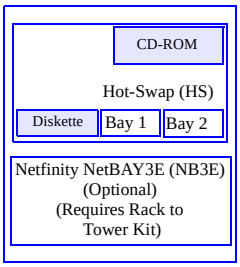
Netfinity 8500R Internal Hard Disk Drive Configurator

Total Internal Storage[1]	7200 RPM Hard Disk Drives (HDDs)			10,000 RPM HDDs		
	9.1 GB (P/N 37L7201)[2]	18.2 GB (P/N 37L7202)[2]	36.4 GB (P/N 37L7203)[2]	9.1 GB (P/N 37L7204)[2]	18.2 GB (P/N 37L7205)[2]	36.4 GB (P/N 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
36.4 GB	-	2	1	-	2	1
72.8 GB (max)	-	-	2	-	-	2

This table does not represent all possible hard drive configurations.
1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.
2. Netfinity 8500R contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.

Bay	Form Factor	Height	Front Access	Usage
-	133 mm (5.25")	HH	Yes	IDE CD-ROM
-	89 mm (3.5")	SL	Yes	Diskette
1...2	HS	HH	Yes	Open
NB3E[1]	19" Rack	3U	Yes	Open

1. A total of three optional 3U NetBAY3Es can be stacked beneath a Netfinity 8500R which has Netfinity 8Ux28D Rack-to-Tower Kit (P/N 28L4705) installed. See IBM Netfinity NetBAY3x Stackable Enclosure section for supported devices.



Part Number	Description	RPM	Height	Bays Supported	Max Qty.
	Ultra160 Hard Disk Drives (HDD)[1]				
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1, 2	2
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1, 2	2
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1, 2	2
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1, 2	2
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1, 2	2
37L7206	36.4 GB 10-K Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1, 2	2
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1, 2	2
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1, 2	2
	External Storage Expansion Units[2]	**Form Factor**			
00N6xxx[7]	Netfinity EXP200 Storage Expansion Unit[3, 6]	Rack (3U)			
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	Tower			
37L0xxx[8]	Netfinity EXP200 350 W Redundant Power Supply[6]	-			
19K11xx[9]	EXP300 Storage Expansion Unit[4, 6]	Rack (3U)			
09N7296	EXP300 Rack-to-Tower Conversion Kit	-			
00N71xx[10]	FAStT EXP500 Storage Expansion Unit[5, 6]	Rack (3U)			
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[6]	-			

1. Netfinity 8500R contains an Ultra2 hot-swap backplane which limits Ultra160 HDDs to Ultra2 bus speeds.
2. Not supported by the onboard external SCSI port. Select an optional SCSI controller then refer to Appendix D: Cables-Storage Units-Controllers to confirm the controller supports the desired External Storage Expansion Unit and to select a supported cable. For HDD or other expansion unit options, see the specific expansion unit section.
3. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350W power supply. Optional hot-swap Netfinity EXP 350W Power Supply P/N 37L0xxx provides redundancy. To convert an EXP200 to a tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit P/N 09N7296 is required.
4. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies. To convert an EXP300 to a tower form factor, EXP300 Rack-to-Tower Conversion Kit P/N 09N7296 is required.
5. FAStT EXP500 Storage Expansion Unit includes dual hot-swap 350 W power supplies.
6. These units do not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order Rack Power Cables according to the number of power supplies.
7. Where 'xxx' represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English:- Line Cords/ Publication Country Kits are included throughout.
8. Where 'xxx' represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.
9.Where 'xx' represents a specific country code: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included throughout.
10. Where 'xx' represents a country specific code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English. Country/ Language Line Cords/Publications are included as indicated.

Internal SCSI Cabling

Netfinity 8500R systems contains an LVDS backplane supporting two hot-swap drive bays that support installation of up to two 3.5-inch, slim-high or half-high HDDs. The backplane is connected to the internal Wide Ultra2 SCSI controller through a 16-bit LVD SCSI cable. RAID support for the internal hot-swap drive bays is provided by adding a supported RAID adapter and moving the standard SCSI cable from the onboard controller to the optional RAID controller. The standard external Wide Ultra2 SCSI port uses a 0.8-mm Very High Density Connector Interface (VHDCI).
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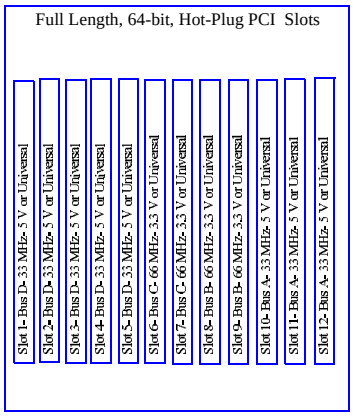
Netfinity 8500R I/O Options

Part Number	Description	Adapter Length	PCI Support	Slots Supported[1]	Hot-Plug[2]	PCI Voltage Key	MHz
	Storage Controllers[3]						
01K7364	Netfinity ServeRAID-3L Ultra2 SCSI Adapter[4]	Full	32-bit	(1...5, 10...12)[8]	X	5	33
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[5]	Full	32/64-bit	(1...5, 10...12)[8]	X	5	33
37L6080	ServeRAID-4M Ultra160 SCSI Controller[6]	Full	32/64-bit	1...12	X	Universal	33
37L6889	ServeRAID-4H Ultra160 SCSI Controller[7]	Full	32/64-bit	1...12	X	Universal	33
19K4646	PCI Wide Ultra160 SCSI Adapter[10]	Half	32/64-bit	1...12	-	Universal	66
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Half	32-bit	1...5, 10...12	-	5	33
	Fibre Storage Controller[9]						
00N6881	Netfinity FAStT Host Adapter	Half	32/64-bit	1...12	X	Universal	66
19K11xx[22]	FAStT200 Storage Server	-	-	-	-	-	-
19K11xx[23]	FAStT200 HA Storage Server	-	-	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	-	-	-	-	-	-
	Networking[11]						
	Ethernet						
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	Half	32-bit	1...12	X	Universal	33
09N9901	10/100 EtherLink Server Adapter by 3Com	Half	32-bit	1...12	X	Universal	33
34L0301	Netfinity Gigabit Ethernet SX Adapter	Half	32/64-bit	1...12	X	Universal	33
	Token Ring						
34L5001	16/4 Token-Ring PCI Management Adapter[12]	Half	32-bit	1...12	X	Universal	33
34L0701	Token-Ring 16/4 PCI Adapter 2 with Wake on LAN[12]	Half	32-bit	1...12	X	Universal	33
34L5201	High speed 100/16/4 Token Ring PCI Management Adapter	Half	32-bit	1...12	-	Universal	33
	Communications[13]						
37L14xx	Serial I/O SST 8, 16 and 128 Port Adapters[14]	Half	32-bit	(1...5, 10...12)[14]	-	5	33
	Systems Management[15]						
03K9309	Netfinity Advanced System Management Interconnect Cable Kit[16]	-	-	-	-	-	-
36L9654	Netfinity Advanced System Management Token-Ring Connection[17]	-	-	-	-	-	-
02K65xx[21]	UltraSlim 56W AC Adapter[18]	-	-	-	-	-	-
	Host Attach						
10L7368	Netfinity ESCON Adapter[19, 20]	Full	32-bit	(1...5, 10...12)[20]	-	5	33

1. The P-6 I/O bus supports four independent 64-bit PCI buses, two of which drive eight 33 MHz, 5.0 V slots (1-5, 10-12), while the other two buses drive four 66 MHz, 3.3 V slots (6-9). The 5 V slots support Universal or 5 V adapters. A 66 MHz adapter plugged into these slots will operate at 33 MHz. The 3.3 V slots support Universal or 3.3 V adapters. A 33 MHz adapter plugged into these slots limits a 66 MHz PCI adapter installed on the same bus to 33 MHz.
2. All 12 Slots are hot-plug capable using IBM's Active PCI technology. For Network Operating System support access URL www.ibm.com/pc/us/compat.
3. Netfinity 8500R includes a dual-port, dual-channel, 64-bit Wide Ultra2 SCSI controller which supports either Single Ended (SE) or Low Voltage Differential SCSI (LVDS) modes. One internal connector and one external port with a 0.8-mm Very High Density Connection Interface (VHDCI) are standard. The internal LVD SCSI cable has sufficient length to attach to an adapter located in slots 10...12. If a boot device (internal or external) is to be attached to an adapter, the adapter must reside in slots 10...12 due to BIOS scanning sequences.
4. Netfinity ServeRAID-3L Ultra2 SCSI Adapter P/N 01K7364 provides either one internal or one external (0.8-mm VHDCI) LVDS SCSI channel.
5. Netfinity ServeRAID-3HB Ultra2 SCSI Adapter P/N 37L6086 provides one internal and two external (0.8 mm VHDCI) LVDS SCSI channels. The internal channel can be configured for external usage (0.8 mm VHDCI) providing a total of three external LVDS SCSI channels. Includes 32 MB of mirrored battery-backup cache, which helps protect against data loss in write-back cache mode in the event of a power outage or adapter maintenance.
6. ServeRAID-4M Ultra160 SCSI Controller is powered by a 100 MHz Intel i960 processor and provides two channels, 64 MB of battery-backed ECC cache and two internal and two external Ultra160 connectors (only two connectors may be utilised). External connectors are 0.8-mm VHDCI.
7. ServeRAID-4H Ultra160 SCSI Controller is powered by a 266 MHz PowerPC 750 processor and provides 128 MB of battery-backed ECC cache with two internal and up to four external Ultra160 connectors (only four connectors may be utilised). External connectors are 0.8-mm VHDCI.
8. A total quantity of eight, in any combination of 01K7364 and 37L6086 is supported.
9. See Fibre Channel Solutions section for additional configuration information.
10. PCI Wide Ultra160 SCSI Adapter P/N 19K4646 provides a single channel with one internal connector and a five-drop multi-mode terminated LVD SCSI cable and one external connector with a 0.8-mm VHDCI connector. Only one of the two connectors may be utilised.
11. Netfinity 8500R does not include an onboard network controller.
12. The Wake on LAN function of this option is not supported by Netfinity servers.
13. Netfinity 8500R includes two USB ports, two high-speed serial/asynchronous ports, (NS 16550A compatible), and one high-speed (up to 2 MBps data transfer speed) bi-directional parallel port supporting devices using ECP/EPP/SSP protocols adhering to the IEEE 1284 standard.
14. See Appendix E for details on Serial I/O options and configuration limitations. A maximum of four Serial I/O adapters (any combination of P/N 37L1414, 37L1415, 37L1416) may be installed.
15. Netfinity 8500R ships standard with a Netfinity Advanced System Management PCI Adapter.
16. Required for all Netfinity Servers containing a standard Advanced System Management Processor that are to be interconnected for system management support through a LAN or modem connection (Netfinity 5500 models 1xX...4xX are not supported). Up to 12 service processors may be interconnected (including standard and optional processors) with an aggregate connection length of no more than 91.4 meters (300 ft). A customer-supplied Ethernet cable is required for each interconnection.
17. Contains an IBM Turbo 16/4 Token-Ring PCI Card, which installs in the PCMCIA card slot of Netfinity Advanced System Management PCI Adapter and a PC Card to 9-pin D-Shell cable which is routed to a rear chassis cut-out. The Netfinity Advanced System Management PCI Adapter's integrated Ethernet port and Netfinity Advanced System Management Token-Ring Connection cannot be connected or used together. To download the latest firmware, access URL www.ibm.com/pc/us/netfinity. Select "Server Support", "Family", "Model", "Downloadable Files" and finally "Advanced System Management".
18. Although the 8500R integrated Netfinity Advanced System Management PCI Adapter is powered continuously through the redundant power supply subsystem, an even higher level of availability is offered with the addition of UltraSlim 56W AC Adapter by allowing an independent power source or connection to a separate optional UPS.
19. Provides an ESCON MIC and DB9 Serial Port. Cables are not included but are available through S/390 channels. Contact your IBM representative for additional information.
20. A maximum of two ESCON adapters (installed in non-adjacent slots) are supported in a single Netfinity server. Where possible, install in a minimally loaded bus.
21. Where 'xx' represents a country specific code: 84=Denmark, 89=Israel, 88=Italy, 85=South Africa/India, 87=Switzerland, 86=UK, 83=EU1.
22.Where 'xx' represents a country specific code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English. Country/Language - Line Cords/Publications are included as indicated
23.Where 'xx' represents a country specific code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English. Country/Language - Line Cords/Publications are included as indicated.



Netfinity 8500R Power, Monitors, Accessories

Part Number	Description
	Power[1]
94G7448	Rack Power Cable Type C12 (3.7m, 12 ft.)[8]
	Uninterruptible Power Supply (UPS)[2]
30RIxxx[10]	APC Smart-UPS 3000RMB[3]
37L6862	APC Smart-UPS 5000RMB[4]
	Monitors[5]
T3347xx[9]	E51 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[6]
31H2Nxx[9]	E54 Color Monitor 15” (350-mm, 13.8” Viewable Image Size), stealth black[6]
T32N3xx[9]	E74 Color Monitor 17” (403-mm, 15.9” Viewable Image Size), stealth black[6]
T274Axx[9]	G78 Color Monitor 17” (454-mm, 17.9” Viewable Image Size), stealth black[6]
11AG1xx[9]	T54A TFT LCD Color Monitor (306-mm x 230-mm, 15.0” Viewable), stealth black[7]

1.Netfinity 8500R systems contain three 750 W (at 220 V), hot-swap power supplies which handle robust configurations while providing full redundancy. Even though multiple UPSs may provide redundant power sources, systems management software does not currently take advantage of its power outage alerts.
2. For runtimes and UPS attributes see Appendix C: UPS Runtime Estimates.
3. Height is 3U. See “Rack and NetBAY” for supported IBM racks.
4. Height is 5U. See “Rack and NetBAY” for supported IBM racks.
5. Netfinity 8500R uses an SVGA controller (S3 Trio 3D chipset) with 4 MB of video memory.
6. Installation within a rack requires optional Monitor Compartment P/N 94G7444.
7. Installation within a rack requires optional Netfinity Flat Panel Monitor Rack Mount Kit P/N 37L6888 and Netfinity Rack Keyboard Tray P/N 28L4707. A space saver keyboard may coexist within the same keyboard tray.
8. Rack Power Cable P/N 94G7448 (type C12 - one for each Power Supply), must be ordered for power connection to a high voltage UPS or PDU.
9. Where ‘xx’ represents a specific country code: DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, CH=Switzerland, UK=UK, EU=Europe.
10. Where ‘xxx’ represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

Part Number	Description
	Conversion Kits
28L4705	8Ux28D Rack-to-Tower Kit[1]
	Rack and NetBAY[2,12]
930842P	Netfinity Enterprise Rack
930842X	Netfinity Enterprise Expansion Cabinet
9306900	Netfinity Rack[3]
9306910	Netfinity Rack[3] (includes perforated front door)
36L9703	Netfinity Rack Extension Kit
9306200	Netfinity NetBAY22[4]
36L9702	NetBAY22 Rack Extension Kit
36L9701	Netfinity NetBAY3E[5]
37L6888	Netfinity Flat Panel Monitor Rack Mount Kit
94G7448	Rack Power Cable Type C12 (3.7m)[12]
	Keyboard and Mouse[6]
28L36xx[10]	Space Saver Keyboard[7, 8]
28L36xx[11]	Preferred Keyboard (stealth black)[9]
28L3675	Sleek 2-Button Stealth Black Mouse

1. Includes one Netfinity NetBAY3E with casters.
2. Netfinity 8500R is housed in a 19” rack mountable drawer and requires one of the racks listed here. See “IBM Netfinity Rack Cabinet and Options” section for IBM rack supported devices.
3. Netfinity Rack Extension Kit P/N 36L9703 is required for proper rear door closure clearance.
4. NetBAY22 Rack Extension Kit P/N 36L9702 is required for proper rear door closure clearance.
5. A maximum of three NetBAY3E enclosures may be stacked beneath a supported Netfinity tower server (conversion kit P/N 28L4705 required). See IBM Netfinity NetBAY3X Stackable Enclosure section for supported devices.
6.Netfinity 8500R ships without a keyboard or mouse.
7. Installation within a rack requires optional keyboard tray P/N 28L4707 (stows in “ready-to-use” position).
8. Advanced TrackPoint IV features are not available on IBM Netfinity sy.stems.
9. Installation within a rack requires optional keyboard tray P/N 28L4707. This keyboard cannot share a keyboard tray with a flat panel display.
10. Where ‘xx’ represents country specific code: 46=Danish , 47=France, 48=Germany, 49=Italian, 50=Spanish, 51=UK English, 44=US English, and P/N 19K3831=Switzerland, 19K3832=Sweden/Finland, 19K3833=Portugal, 19K3834=Belgium, 19K3836=Russia, 19K3837=Poland.
11. Where ‘xx’ represents a country specific code: 25=French, 26=German, 27=Italian, 29=English, 31=Danish, 33=Norwegian, 34=Swedish/Finnish, 35=Swiss, 36=Dutch.
12. The Netfinity 8500R ships with a standard country power cord. For connection to a high voltage UPS or PDU, a Rack Power Cable P/N 94G7448 (type C12), must be ordered.

Netfinity 8500R Tape Options

Part Number	Description	Bays Supported	SCSI Interface (bit)	Form Factor	Termination Included	68/50-pin Converter Incl.	Ext. Tape Encl.
00N7991	20/40 GB DDS/4 4-mm Internal Tape Drive	N/A	16 Ultra2 LVD	89 mm (3.5") HH or 133 mm (5.25") HH	Y	N/A	10L7440 03K8756[1]
01K1325	20/40 GB 8-mm Internal SCSI Tape Drive	N/A	16	133 mm (5.25") HH	N	N/A	10L7440[2] 03K8756
09N4040	20/40 GB DLT Internal SCSI Tape Drive	N/A	8	133 mm (5.25") FH	N	Y	03K8705[2], 03K8756
00N7990	40/80 GB DLT Internal SCSI Tape Drive	N/A	16 Ultra2 LVD	133 mm (5.25") FH'	N	N/A	03K8705[2], 03K8756[1]
00N8017	60/120GB 8-mm M2 SCSI Tape Drive	N/A	16 Ultra2 LVD	133 mm (5.25") HH	N	N/A	10L7440[2], 03K8756[1]
	Tape Autoloaders						
00N79xx[9]	DLT Tape Autoloader	-	16	Desktop	Y	N/A	-
00N7992	120/240GB DDS/4 Tape Autoloader	N/A	16 Ultra2 LVD	133 mm (5.25") FH	N	N/A	03K8756[1]
	External Tape Libraries[3]						
00N79xx[10]	DLT Tape Library	-	16	Desktop or Rack	Y	-	-
	External Tape Enclosures						
10L7440	External Half High SCSI Storage Enclosure[4]	-	8/16	Desktop	N	N	-
03K8705	DLT External SCSI Enclosure[5]	-	16	Desktop	N	N	-
03K8756	NetMEDIA Storage Expansion Unit EL[6]	-	16	Rack	Y	N	-
10L7113	NetMEDIA Systems Management Adapter[7]	-	16 LVD	-	N	N	03K8756
	Associated Options						
00N7956	68-pin External Multimode LVD/SE SCSI Terminator	-	16 LVD/SE	Ext.	Y	N	10L7440, 03K8705
10K2340	Media BayTray and LVD Cable Kit[1,8]	-	16 LVD	Int.	Y	N	-

Note: Netfinity 8500R does not support internal tape drives but does include an external Ultra2 0.8-mm VHDCI SCSI connector for attachment of an external tape or tape enclosure. All tape drives and enclosures are also supported by PCI Wide Ultra160 SCSI Adapter P/N 19K4646 which has an external 0.8-mm VHDCI connector. Select tape drive, enclosure and controller then use Appendix D: Cables-Storage Units-Controllers to select an appropriate external cable

1. LVD support for LVD devices requires installation of the 16-bit multi-mode terminated, two-drop, SCSI cable included with optional Media Bay Tray and LVD Cable Kit P/N 10K2340.
2. Requires 68-pin External Multimode LVD/SE SCSI terminator P/N 00N7956.
3. Tape library attributes and prerequisites are located in Appendix B: Tape Library Attributes.
4. Provides a black desktop 133 mm (5.25") half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
5. Provides a black desktop DLT tape enclosure with a 68-pin high density external connector. Requires termination by the tape drive or by installation of an External Multimode LVD/SE SCSI terminator P/N 00N7956.
6. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19" rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half high (HH) extended length 133 mm (5.25") bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two power cords are also included.
7. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
8. Media Bay Tray and LVD Cable Kit P/N 10K2340 includes an internal two-drop multi-mode terminated LVD SCSI cable.
9. Where 'xx' represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.
10. Where 'xx' represents a country specific power cord code: *Tower versions* - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: *Rack versions* - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

Note: Additional tape attributes can be found in Appendix A: Tape Drive Attributes.

Note: For a complete list of all IBM and non-IBM options compatibility with Network Operating Systems and IBM xSeries and Netfinity Servers, access the IBM Proven compatibility pages on the Web at URL http://www.pc.ibm.com/us/compat

Netfinity 8500R Sample Configurations

The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

High Availability-Rack

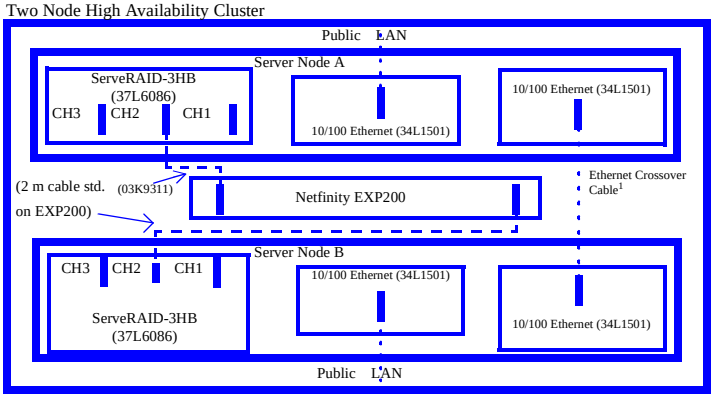
Part Number	Description	Quantity	Usage
18RYNxx	Netfinity 8500R (PIII Xeon 700/2MB 512 MB/Rack) (8U)	1	Power Redundancy standard
10K2166	Netfinity 8500R 700 MHz/2MB Upgrade with Pentium III Xeon Processor	5	Total of 6 SMP processors
10K2335	Netfinity 4X Accelerator Filter	1	Required for greater than 4 processors in this model
10K2337	Netfinity Mezzanine Expansion Kit	1	Required for greater than 4 processors in this model
20L0247	Netfinity 256 MB SDRAM ECC RDIMM II	8	Total of over 2 GB of memory
28L4454	Netfinity 8500R Memory Expansion Card	1	Enables cache line interleaving
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	2	NOS mirroring
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	1	RAID Controller - NOS plus EXP200
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	1	-
31H2Nxx	E54 Color Monitor 15” (13.8” Viewable Image Size), stealth black	1	-
28L36xx	Space Saver Keyboard	1	-
30RIxxx	APC Smart-UPS 3000RMB	1	-
External Storage			
03K8756	NetMEDIA Storage Expansion Unit EL	1	External Tape Drive Enclosure
00N7990	40/80 GB DLT Internal SCSI Tape Drive	2	Installs in 03K8756
00N6xxx	Netfinity EXP200 Storage Expansion Unit	1	Provides additional 10 bays
37L0xxx	Netfinity EXP200 350 W Redundant Power Supply	1	-
03K9311	Netfinity 4.2 M Ultra2 SCSI Cable	2	Tape to Onboard SCSI, 3-HB to EXP200
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	6	RAID 5 with Hot-Spare in EXP200
Rack Options			
9306200	Netfinity NetBAY22	1	Monitor and keyboard mount on top
36L9702	NetBAY22 Rack Extension Kit	1	Required for rear door closure
94G7448	Power Cable - Type C12	5	-
94G6670	Blank Filler Panel Kit	1	-

This high availability server is configured to act as the foundation for business critical applications, applications your business cannot afford to be without. The configuration includes enough disk drives to mirror the operating system and provide a RAID 5 data environment, power supply redundancy by the server and EXP200 and a UPS for power even during a blackout. A rack mounted tape drive is included to back up that all important asset...data. This server represents the leading edge in high availability.

Notes/Exchange-Stack

Part Number	Description	Quantity	Usage
17RYNxx	Netfinity 8500R (PIII Xeon 700/1 MB 512 MB/Rack) (8U)	1	Power redundancy standard
10K2330	Netfinity 8500R 700 MHz/1 MB Upgrade with Pentium III Xeon Processor	5	Total of 6 SMP processors
10K2335	Netfinity 4x Accelerator Filter	1	Required for greater than 4 processors
10K2337	Netfinity Mezzanine Expansion Kit	1	Required for greater than 4 processors
20L0249	Netfinity 512 MB SDRAM ECC RDIMM II	3	Total of 2 GB of memory
28L4454	Netfinity 8500R Memory Expansion Card	1	Enables cache line interleaving
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	2	NOS Mirroring
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	1	-
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	1	NOS plus EXP200
31H2Nxx	E54 Color Monitor 15” (13.8” Viewable Image Size), stealth black	1	-
28L36xx	Space Saver Keyboard	1	-
30RIxxx	APC Smart-UPS 3000RMB	1	-
External Storage			
03K8756	NetMEDIA Storage Expansion Unit EL	1	External Tape Enclosure - Install in NetBAY3E
00N7990	40/80 GB DLT Internal SCSI Tape Drive	2	Installs in 03K8756
03K9310	Netfinity 2M Ultra2 SCSI Cable	1	Tape to Onboard SCSI
00N6xxx	Netfinity EXP200 Storage Expansion Unit	1	Provides additional 10 Bays, 1 x 2M cable
37L0xxx	Netfinity EXP200 350 W Redundant Power Supply	1	-
3L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10	RAID 5 with Hot-Spare in EXP200
Stack Options			
28L4705	8Ux28D Rack-to-Tower Kit	1	-
36L9701	Netfinity NetBAY3E	3	3 x 3U enclosure for UPS, EXP200, Tape

Two Node High Availability Cluster



1.Customer supplied Ethernet Crossover Cable may vary in length up to a maximum of 25 feet (7.6 m).

Two Node High Availability Cluster

Part Number	Description	Quantity	Usage
	Server Nodes A & B		
18RYNxx	Netfinity 8500R (PIII Xeon 700/2 MB 512 MB/Rack) (8U)	2	Power redundancy standard
10K2166	Netfinity 8500R 700 MHz/2 MB Upgrade with Pentium III Xeon Processor	10	Total of 6 SMP processors per node
10K2335	Netfinity 4X Accelerator Filter	2	Required for greater than 4 processors
10K2337	Netfinity Mezzanine Expansion Kit	2	Required for greater than 4 processors
20L0247	Netfinity 256 MB SDRAM ECC RDIMM II	16	Total of over 2 GB of memory per node
28L4454	Netfinity 8500R Memory Expansion Card	2	Enables cache line interleaving
34L1501	Netfinity 10/100 Ethernet Adapter 2[1]	4	1 for crossover, 1 for public LAN/node
37L6086	Netfinity ServeRAID-3HB Ultra2 SCSI Adapter[2]	2	RAID controller - NOS plus EXP200
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	4	NOS mirroring
30RIxxx	APC Smart-UPS 3000RMB (3U)	2	-
	External Storage		
03K8756	NetMEDIA Storage Expansion Unit EL (3U)	1	External Tape Drive Enclosure
03K9311	Netfinity 4.2 M Ultra2 SCSI Cable[3]	1	03K8756 to onboard SCSI
00N7990	40/80 GB DLT Internal SCSI Tape Drive	1	Installs in 03K8756
00N6xxx	Netfinity EXP200 Storage Expansion Unit (3U)[2]	1	Provides additional 10 bays
37L0xxx	Netfinity EXP200 350 W Redundant Power Supply[2]	1	-
03K9311	Netfinity 4.2 M Ultra2 SCSI Cable[2, 3]	2	3-HB to EXP200
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10	RAID 5 shared storage in EXP200
	Shared (or single occurrence) Resources		
11AG1xx	T54A Flat Panel Color Monitor (15.0" Viewable Image Size), stealth black	1	Mounts in keyboard tray
28L36xx	Space Saver Keyboard	1	-
	Rack Options		
930842P	Netfinity Enterprise Rack	1	-
37L6888	Netfinity Flat Panel Monitor Rack-Mount Kit (3U)	1	Mounts in keyboard tray
28L4707	Netfinity Rack Keyboard Tray	1	-
28L0542	Netfinity Console Server Selector Switch (4-port)	1	-
94G7448	Power Cable-Type C12	4	-
94G7447	12 ft. Console Cable Set	2	-
94G6670	Blank Filler Panel Kit	1	-

1. Requires customer supplied Ethernet Crossover Cable which may vary in length up to a maximum of 25 feet (7.6 m).
2. By replicating this item, up to a total quantity of four ServeRAID-3HB Adapters (plus options) and eleven EXP200s can provide over 2 Terabytes of storage. Additional power and rack space will be required.
3. Cable length requirements are dependent on component placement within the rack or rack suite. To determine specific configuration requirements use the Netfinity Rack and/or Spreadsheet Configurators which can be downloaded from Web site www.pc.ibm.com/europe/configurators

Clustering is a group of interconnected computers used as a single, unified computing resource. Clustering Netfinity servers, like the IBM Netfinity 8500R, provides a high availability solution to keep you in touch with the key applications you need to run your business.

This sample configuration consists of paired IBM Netfinity 8500R cluster nodes equipped with eight-way SMP capability and redundant power supplies. Microsoft Cluster Service (MSCS) has been validated on IBM Netfinity 8500R servers, using the Netfinity ServeRAID-3HB with the EXP200 Storage Expansion Unit. MSCS allows two configured servers, referred to as nodes, to be connected together to form a cluster. Providing system redundancy means that a complete server can fail and client access to server resources is largely unaffected. MSCS extends this theme by also allowing for software failures at an application level as well as an operating system level. If the operating system fails, all applications and services can be restarted on another server, and if just one application fails, it can be managed by MSCS individually. An additional independent network connection is used to perform monitoring within the cluster. One or more disk subsystems are attached to both nodes. In the above example, a Netfinity EXP200 was selected and the Netfinity ServeRAID-3HB Ultra2 SCSI Adapters provide the I/O control. Netfinity ServeRAID-3HB handles the "SCSI heartbeat" connection without the need for a dedicated SCSI connection and logically attaches the quorum disk, which allows arbitration when a failure occurs. Additional information on IBM Netfinity and IBM PC Server Clustering Solutions may be found on the World Wide Web by accessing URL www.ibm.com/pc/us/netfinity/clustering.html.

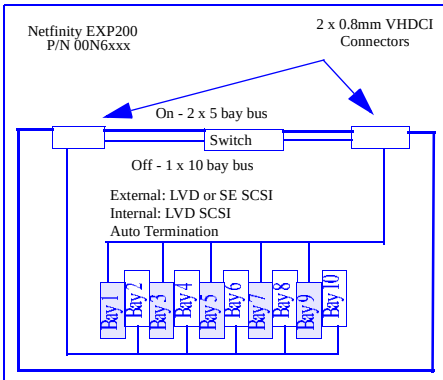
IBM Netfinity EXP200 Configurator

Netfinity EXP200 Hard Disk Drive Configurator

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 37L7201)[2]	18.2 GB (P/N 37L7202)[2]	36.4 GB (P/N 37L7203)[2]	9.1 GB (P/N 37L7204)[2]	18.2 GB (P/N 37L7205)[2]	36.4 GB (P/N 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
9.1 GB	1	-	-	1	-	-
18.2 GB	2	1	-	2	1	-
27.3 GB	3	-	-	3	-	-
36.4 GB	4	2	1	4	2	1
45.5 GB	5	-	-	5	-	-
54.6 GB	6	3	-	6	3	-
63.7GB	7	-	-	7	-	-
72.8 GB	8	4	2	8	4	2
81.9GB	9	-	-	9	-	-
91 GB	10	5	-	10	5	-
109.2 GB	-	6	3	-	6	3
127.4GB	-	7	-	-	7	-
145.6GB	-	8	4	-	8	4
163.8GB	-	9	-	-	9	-
182GB	-	10	5	-	10	5
218.4GB	-	-	6	-	-	6
254.8GB	-	-	7	-	-	7
291.2 GB	-	-	8	-	-	8
327.6 GB	-	-	9	-	-	9
364 GB (max)	-	-	10	-	-	10

This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within ± 0.2 GB unless otherwise noted.
2. Ultra160 HDDs are limited to a maximum of Ultra2 bus speeds.

Bay	Form Factor	Height	Front Access	Usage	Bus
Odd #s	HS	HH	yes	open	1
Even #s	HS	HH	yes	open	2



1. Housed in a 19" rack-mountable drawer and ships standard with a single power supply, power cord and 2 meter Ultra2 SCSI cable.
Requires IBM Netfinity Enterprise Rack (P/N 930842P) or Expansion Cabinet (P/N 9308842X), Rack (P/N 9306900), NetBAY22 (P/N 9306200), NetBAY3 (P/N 10L6912) or NetBAY3E (P/N 36L9701).
External Storage Expansion Unit requires storage controllers and external cables. Select a supported controller from the system configurator and cables from Appendix D: Cables-Storage Units-Controllers.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty.
Ultra160 Hard Disk Drives (HDD)[1]					
37L7201	9.1 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...10	10
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...10	10
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...10	10
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...10	10
37L7205	18.2 GB 10K-4 Ultra160	10,000	SL	1...10	10
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...10	10
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1...10	10
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1...10	10
	External Storage Expansion Unit	**Form Factor**			
00N6xxx[4]	Netfinity EXP200 Storage Expansion Unit[2, 3]	Rack (3U)			
37L5857	Netfinity EXP200 Rack-to-Tower Conversion Kit	-			
37L0xxx[5]	Netfinity EXP200 350 W Redundant Power Supply[3]	-			
94G7448	Rack Power Cable Type C12 (3.7m)[3]	-			

1. Ultra160 HDDs are limited to a maximum of Ultra2 bus speeds.
2. Netfinity EXP200 Storage Expansion Unit ships with 10 half-high hot-swap bays which can be configured as a single bus, two independent buses or twintailed single bus. Netfinity EXP200 includes a single 2 M Ultra2 SCSI cable and a single hot-swap 350 W power supply. Optional hot-swap Netfinity EXP200 350W Power Supply (P/N 37L0xxx) provides redundancy. To convert an EXP200 to a tower form factor, Netfinity EXP200 Rack-to-Tower Conversion Kit (P/N 37L5857) is required.
3. These units do not include Rack Power Cables P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). Standard country power cords only are included. If required, order Rack Power Cables according to the number of power supplies.
4. Where 'xxx' represents a specific country code: 899=US/French, 900=European/English, 901=European/Spanish, 902=European/French, 903=European/German, 904=Danish/English, 905=Israel/English, 906=Italian/Italian, 907=South Africa/English, 908=Swiss/English, 909=Swiss/French, 910=Swiss/German, 912=UK/English:- Line Cords/ Publication Country Kits are included throughout.
5. Where 'xxx' represents a country specific code:076=Euro/English , 077=Danish/English, 078=Israel/English, 079=Italy/English, 080=South Africa/English, 081=Swiss/English, 082=UK/English. Line Cords/Publication Kits are included throughout.

Limitations

Netfinity EXP200 hot-swapping of HDDs is restricted to a HDD that is inactive or where a lighted fault LED is indicated. The EXP200 is not supported when the SCSI channel of the SCSI adapter to which it is attached is split between internal devices and external devices. Each EXP200 must be attached to a dedicated SCSI channel of a supported SCSI adapter. The standard EXP200 configuration is supported as a rack drawer and is not currently supported for stacking directly on one another. It can be installed in a Netfinity NetBAY3 or NetBAY3E storage unit and stacked up to three units high, with a supported server on top. In addition, it can be converted to a tower with the addition of a Netfinity EXP200 Rack-to-Tower Conversion Kit (37L5857). See Appendix D: Cables- Storage Units- Controllers for supported controllers and cables. A single two meter cable is included with the EXP200.

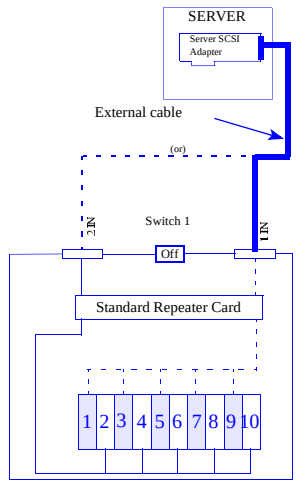
Cables and Controllers:
See Appendix D: Cables - Storage Units - Controllers

Sample Configurations

The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

Netfinity EXP200 One Independent SCSI Bus

To configure as a single 10 drive SCSI channel, attach one external cable from the SCSI adapter to either the 1 IN or 2 IN connectors in the EXP200. Set switch 1 to "Off" position.

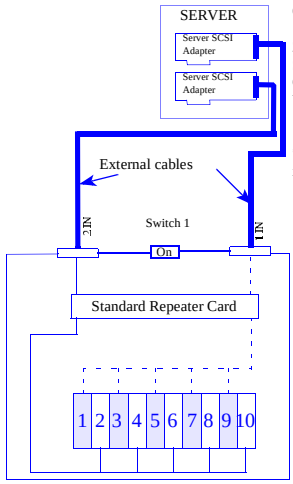


Order:
1 x 00N6xxx
1 x External Cable*
See Cables - Storage Units - Controllers section
Up to 10 Disk Drives
19" Rack Space
* One 2M Ultra2 cable is included with each EXP200.

Operational mode (SCSI F/W, Ultra SCSI, Ultra2 SCSI) may be limited by controller, cable or cable length. See Appendix D for additional information.

Netfinity EXP200 Two Independent SCSI Buses

To configure as two independent 5 drive SCSI channels, attach one external cable from the SCSI adapter to the SCSI bus 1 IN connector in the EXP200. Attach a second External SCSI cable from another SCSI adapter, in the same or separate server, to the 2 IN connector in the unit. Set switch 1 to "On" position.



Order:
1 x 00N6xxx
2 x External Cables*
See Cables - Storage Units - Controllers section
Up to 10 Disk Drives
19" Rack Space

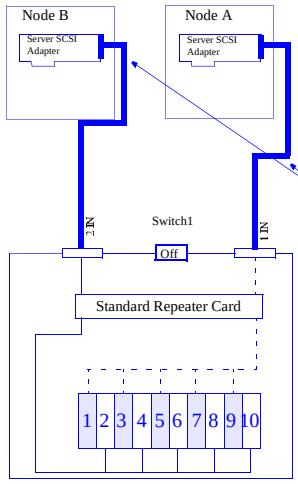
* One 2M Ultra2 cable is included with each EXP200.

Operational mode (SCSI F/W, Ultra SCSI, Ultra-2 SCSI) may be limited by controller, cable or cable length, or hard disk drive type. See Appendix D for additional information.

Netfinity EXP200 One Independent SCSI Bus

High Availability Configuration

To configure a single 10 drive SCSI channel for clustering, attach one external cable from the SCSI adapter in Node A to the 1 IN connector in the EXP200. Connect a second external cable to a SCSI adapter in Node B and to the 2 IN connector in the EXP200.



Order:
1 x 00N6xxx
2 x External Cables*
See Cables - Storage Units - Controllers section
Up to 10 Disk Drives
19" Rack Space
* One 2M Ultra2 cable is included with each EXP200.

Operational mode (SCSI F/W, Ultra SCSI, Ultra-2 SCSI) may be limited by controller, cable, or cable length. See Appendix D for additional information.

IBM EXP300 Configurator

EXP300 Hard Disk Drive Configurator

Total Int. Storage[1]	7200RPM Hard Disk Drives (HDDs)			10,000RPM Hard Disk Drives (HDDs)		
	9.1 GB (P/N 37L7201)[2]	18.2 GB (P/N 37L7202)[2]	36.4 GB (P/N 37L7203)[2]	9.1 GB (P/N 37L7204)[2]	18.2 GB (P/N 37L7205)[2]	36.4 GB (P/N 37L7206)[2]
0 GB	Standard on Base Models			Standard on Base Models		
18.2 GB	2	1	-	2	1	-
36.4 GB	4	2	1	4	2	1
54.6 GB	6	3	-	6	3	-
72.8 GB	8	4	2	8	4	2
91 GB	10	5	-	10	5	-
109.2 GB	12	6	3	12	6	3
127.4 GB	14	7	-	14	7	-
145.6GB	-	8	4	-	8	4
182 GB	-	10	5	-	10	5
218.4 GB	-	12	6	-	12	6
254.8 GB	-	14	7	-	14	7
291.2 GB	-	-	8	-	-	8
364.0 GB	-	-	10	-	-	10
436.8 GB	-	-	12	-	-	12
509.6 GB (max.)	-	-	14	-	-	14

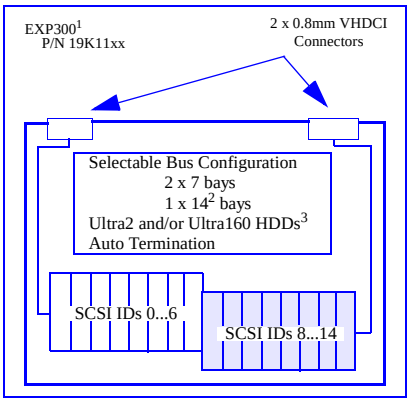
This table does not represent all possible hard drive configurations.
1. Select a total storage row then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +/- 0.2 GB unless otherwise noted.
2. When combined with a ServeRAID-4x controller, Ultra2 and Ultra160 HDD's may be mixed on the same bus and operate up to their maximum respective speeds.

SCSI ID	Form Factor	Height	Front Access	Usage
0...6	HS	SL	Yes	open
8...14	HS	SL	Yes	open

	Maximum MB/s	
Cable Length (Meters	Ultra2 Controller	Ultra160 Controller
2	80	160
4.2	80	160

1. The EXP300 ships with a single Ultra2 SCSI cable similar to Netfinity 2M Ultra2 SCSI Cable (P/N 03K9310).

Part Number	Description	RPM	Height	Bays Supported[1]	Max. Qty.
	Ultra 160 Hard Disk Drives (HDD)[2]	**RPM**	**Height**	**Bays Supported**	
37L7201	9.1 GB Wide Ultra2 SCSI Hot-Swap SL HDD	7200	SL	1...14	14[3]
37L7202	18.2 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...14	14[3]
37L7203	36.4 GB Ultra160 SCSI Hot-Swap SL HDD	7200	SL	1...14	14[3]
37L7204	9.1 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...14	14[3]
37L7205	18.2 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...14	14[3]
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	10,000	SL	1...14	14[3]
19K0655	9.1 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1...14	14[3]
19K0656	18.2 GB 15K-rpm Ultra160 SCSI Hot-Swap HDD	15,000	SL	1...14	14[3]



1. Housed in a 19” rack mountable drawer and ships standard with redundant 500 W hot-swap power supplies, two power cords and a single 2M Ultra2 SCSI cable capable of supporting Ultra160 speeds.
2. Twintailing reduces the maximum number of HDDs on a single bus to 13.
3. When combined with a ServeRAID-4x controller, Ultra2 and Ultra160 HDDs may be mixed on the same bus and operate at up to their maximum respective speeds.

Requires IBM Netfinity Enterprise Rack (930842P) or Expansion Cabinet (930842X), Rack (9306900), NetBAY22 (9306200), NetBAY3 (10L6912), NetBAY3E (36L9701) or Rack-to-Tower Conversion Kit (09N7296).

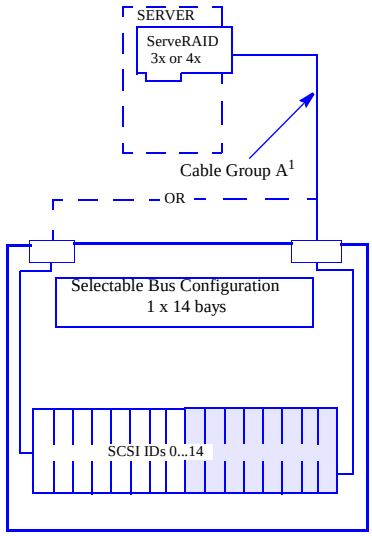
External Storage Expansion Units require storage controllers and external cables. Select a supported controller from the system configurator and cables from Appendix D: Cables-Storage Units-Controllers.

	External Storage Expansion Unit	Form Factor
19K11xx[6]	EXP300 Storage Expansion Unit[4, 5]	Rack (3U)
09N7296	EXP300 Rack-to-Tower Conversion Kit	-
94G7448	Rack Power Cable Type C12 (3.7m)[5]	-

1. EXP300 Storage Expansion Unit ships with 14 slim-line hot-swap bays which can be configured as a single bus, two independent buses or a twintailed single bus.
2. When combined with a ServeRAID-4x controller, Ultra2 and Ultra160 HDDs may be mixed on the same bus and operate at up to their maximum respective speeds.
3.Twintailing reduces the maximum number of HDDs on a single bus to 13.
4. EXP300 includes a single 2 M Ultra2 SCSI cable and dual hot-swap 500W redundant power supplies.
5. This unit does not include a Rack Power Cable P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). A standard country power cord only is included. If required, order a Rack Power Cable.
6. Where ‘xx’ represents a specific country code: 51=US/English, 52=European/English, 56=Danish/English, 57=Israel/English, 58=Italian/English, 59=South Africa/English, 60=Swiss/English, 63=UK/English:- Line Cords/ Publication Country Kits are included throughout.

Cables and Controllers:
See Appendix D: Cables - Storage Units - Controllers

EXP300 One Independent SCSI Bus

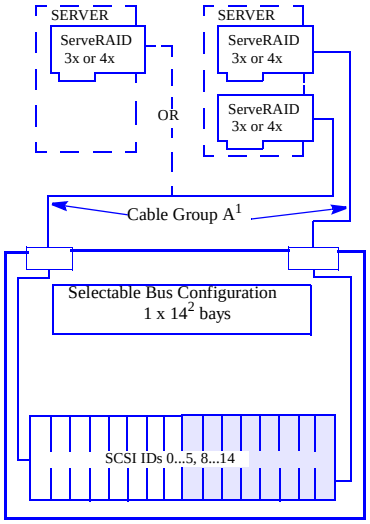


Order:
- 1 x P/N 19K11xx
- 1 x External Cable from Group A[1]
- Up to 14 Ultra2 and/or Ultra160 HDDs

1. One 2 M Ultra2 cable is included with each EXP300. If a longer cable is desired, select one from cable group A.

EXP300 One Independent Twintail SCSI Bus High Availability Configuration

To configure as one independent twintailed 13 bay SCSI bus, attach two external cables from two ServeRAID adapters, in the same or separate servers, to the two external ports of the EXP300. The EXP300 must be set for 1 x 14[2] bays.

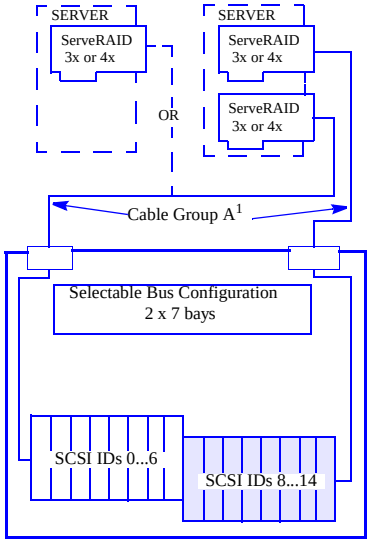


Order:
- 1 x P/N 19K11xx
- 2 x External Cables from Group A[1]
- Up to 13 Ultra2 and/or Ultra160 HDDs

1. One 2 M Ultra2 cable is included with each EXP300. If a longer cable is desired, select one from cable droup A.
2. Twintailing reduces the maximum number of HDDs on a single bus to 13.

EXP300 Two Independent SCSI Buses

To configure as two independent 7 bay SCSI buses, attach two external cables from two ServeRAID adapters, in the same or separate servers, to the two external ports of the EXP300. The EXP300 must be set for 2 x 7 bays.



Order:
- 1 x P/N 19K11xx
- 2 x External Cables from Group A[1]
- Up to 14 Ultra2 and/or Ultra160 HDDs

1. One 2 M Ultra2 cable is included with each EXP300. If a longer cable is desired, select one from cable droup A.

IBM FAStT200 (HA) Configurator

FAStT200 Storage Server - Hard Disk Drive Configurator

Total Internal Storage[1]	10,000 RPM Hard Disk Drives (HDDs)			
	9.1 GB (P/N 37L6209)	18.2 GB (P/N 37L6210 or P/N 19K0652)	36.4 GB (P/N 37L6211 or P/N 19K0653)	73.4 GB (P/N 19K0654)
0 GB	Standard on all Base Models			
18.2 GB	2 or	1	-	-
36.4 GB	4 or	2 or	1	-
54.6 GB	6 or	3	-	-
72.8 GB	8 or	4 or	2	-
73.4 GB	-	-	-	1
91.0 GB	10 or	5	-	-
109.2 GB	-	6 or	3	-
145.6 GB	-	8 or	4	-
146.8 GB	-	-	-	2
182.0 GB	-	10 or	5	-
218.4 GB	-	-	6	-
220.2 GB	-	-	-	3
254.8 GB	-	-	7	-
291.2 GB	-	-	8	-
293.6 GB	-	-	-	4
327.6 GB	-	-	9	-
364.0 GB	-	-	10	-
367.0 GB	-	-	-	5
440.4 GB	-	-	-	6
513.8 GB	-	-	-	7
587.2GB	-	-	-	8
660.6 GB	-	-	-	9
734.0 GB (max)	-	-	-	10

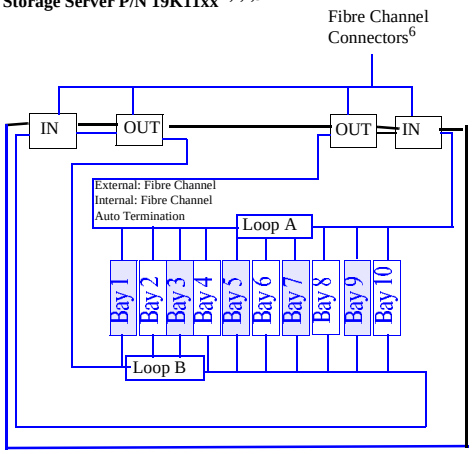
This table does not represent all valid hard drive configurations.
1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +- 0.2 GB unless otherwise noted.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty Supported
37L6209	9.1 GB 10K-3 FC Hot-Swap HDD	10,000	SL	1...10	10
37L6210	18.2 GB 10K-3 FC Hot-Swap HDD	10,000	SL	1...10	10
37L6211	36.4 GB 10K-3 FC Hot-Swap HDD	10,000	HH	1...10	10
19K0652	18.2 GB 10K-4 FC Hot-Swap HDD	10,000	SL	1...10	10
19K0653	36.4 GB 10K-4 FC Hot-Swap HDD	10,000	SL	1...10	10
19K0654	73.4GB 10K-4 FC Hot-Swap HDD	10,000	HH	1...10	10

External Storage Expansion Unit		Form Factor
19K11xx[4]	FAStT200 Storage Server[1,2,3]	Rack (3U)
19K11xx[5]	FAStT200 HA Storage Server[1,2]	Rack (3U)
19K1121	FAStT200 Redundant RAID Controller[3]	-
94G7448	Rack Power Cable Type C12 (3.7m)[2]	-

1. The FAStT200 Storage Server and HA Storage Server include two hot-swap, 350 W auto-ranging redundant power supplies.
2. These units do not include a Rack Power Cable P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). A standard country power cord only is included. If required, order a Rack Power Cable.
3. Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controler P/N 19K1121.
4. Where 'xx' represents a country specific code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English. Country/Language - Line Cords/Publications are included as indicated
5. Where 'xx' represents a country specific code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English. Country/Language - Line Cords/Publications are included as indicated.

IBM FAStT200 Storage Server P/N 19K11xx [1,2,3,5]
IBM FAStT200 HA Storage Server P/N 19K11xx [1,2,4,5]



1. Housed in a 19" Rack mountable drawer and ships standard with redundant power supplies and two standard country power cables requiring separate power sources. Requires IBM industry standard 19" rack, EIA-310D, with a minimum depth of 24" (711.2 mm) or NetBAY3/3E.

Note: External Storage Expansion Units require storage controllers and external cables. Select a supported controller from the system configurator and cables from Appendix D: Cables-Storage-Units-Controllers.

2. The FAStT200 Storage Server includes a single loop only. The second loop (shown in the diagram) is available with the addition of a FAStT200 Redundant RAID Controller P/N 19K1121. This configuration then becomes equivalent to the FAStT200 HA Storage Server.
3. Where 'xx' represents a country specific code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English. Country/Language - Line Cords/Publications are included as indicated.
4. Where 'xx' represents a country specific code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English. Country/Language - Line Cords/Publications are included as indicated.
5. This unit does not include a Rack Power Cable P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). A standard country power cord only is included. If required, order a Rack Power Cable.
6. GBICs are not included. Either Fibre Channel Long or Short-Wave GBICs (P/N 03K9307 or 03K9308 respectively) may be used.

IBM FAStT EXP500 Configurator

FAStT EXP500 Storage Expansion Unit - Hard Disk Drive Configurator

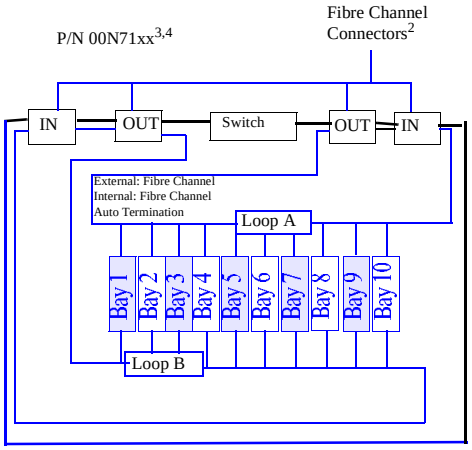
Total Internal Storage[1]	10,000 RPM Hard Disk Drives (HDDs)			
	9.1 GB (P/N 37L6209)	18.2 GB (P/N 37L6210 or P/N 19K0652)	36.4 GB (P/N 37L6211 or P/N 19K0653)	73.4 GB (P/N 19K0654)
0 GB	Standard on all Base Models			
18.2 GB	2 or	1	-	-
36.4 GB	4 or	2 or	1	-
54.6 GB	6 or	3	-	-
72.8 GB	8 or	4 or	2	-
73.4 GB	-	-	-	1
91.0 GB	10 or	5	-	-
109.2 GB	-	6 or	3	-
145.6 GB	-	8 or	4	-
146.8 GB	-	-	-	2
182.0 GB	-	10 or	5	-
218.4 GB	-	-	6	-
220.2 GB	-	-	-	3
254.8 GB	-	-	7	-
291.2 GB	-	-	8	-
293.6 GB	-	-	-	4
327.6 GB	-	-	9	-
364.0 GB	-	-	10	-
367.0 GB	-	-	-	5
440.4 GB	-	-	-	6
513.8 GB	-	-	-	7
587.2GB	-	-	-	8
660.6 GB	-	-	-	9
734.0 GB (max)	-	-	-	10

This table does not represent all valid hard drive configurations.
1. Select a total storage row and then select the quantity of HDDs from a column corresponding to the hard disk drive of choice. Total Internal Storage listed is within +- 0.2 GB unless otherwise noted.

Part Number	Description	RPM	Height	Bays Supported	Max. Qty Supported
37L6209	9.1 GB 10K-3 FC Hot-Swap HDD	10,000	SL	1...10	10
37L6210	18.2 GB 10K-3 FC Hot-Swap HDD	10,000	SL	1...10	10
37L6211	36.4 GB 10K-3 FC Hot-Swap HDD	10,000	HH	1...10	10
19K0652	18.2 GB 10K-4 FC Hot-Swap HDD	10,000	SL	1...10	10
19K0653	36.4 GB 10K-4 FC Hot-Swap HDD	10,000	SL	1...10	10
19K0654	73.4GB 10K-4 FC Hot-Swap HDD	10,000	HH	1...10	10
External Storage Expansion Unit		**Form Factor**			
00N71xx[3]	FAStT EXP500 Storage Expansion Unit[1,2]	Rack (3U)			
94G7448	Rack Power Cable Type C12 (3.7m)[2]	-			

1. The FAStT EXP500 Storage Expansion Unit includes two hot-swap, 350 W auto-ranging redundant power supplies.
2. This unit does not include a Rack Power Cable P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU). A standard country power cord only is included. If required, order a Rack Power Cable.
3. Where 'xx' represents a country specific code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English. Country/Language Line Cords/Publications are included as indicated.

IBM FAStT EXP500 Storage Expansion Unit[1]



1. Housed in a 19" Rack mountable drawer and ships standard with redundant power supplies and two standard country power cables requiring separate power sources. Requires IBM industry standard 19" rack, EIA-310D, with a minimum depth of 24" (711.2 mm) or NetBAY3/3E.

Note: External Storage Expansion Units require storage controllers and external cables. Select a supported controller from the system configurator and cables from Appendix D: Cables-Storage-Units-Controllers.

2. GBICs are not included. Either Fibre Channel Long or Short-Wave GBICs (P/N 03K9307 or 03K9308 respectively) may be used.
3. Where 'xx' represents a country specific code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English. Country/Language Line Cords/Publications are included as indicated.
4. This unit does not include a Rack Power Cable P/N 94G7448 when shipped (for attachment to high voltage UPS or PDU).

Fibre Array Solutions

Fibre Interconnection Guidelines

Part Number	Description	00N6881 FAStT Host Adapter	00N6882 FAStT Mini Hub[1]	01K7296 FC Failsafe RAID Controller	19K1121 FastT200 Redun. Raid Controller[1]	2108R3S SAN Data Gateway Router (SE)[1]	2109S08 SAN FC Switch, 8-Port[1]	2109S16 SAN FC Switch, 16-Port[1]	SFCU1xx[3] FC RAID Controller Unit	35L1647 SAN FC Managed Hub[1]	19K11xx[5] FAStT200 Storage Server[1]	19K11xx[6] FAStT200 HA Storage Server[1]	00N69xx[2] FAStT500 Storage Server[1]	00N71xx[4] FAStT EXP500[1]
00N6881	FAStT Host Adapter	-	-	S	S	S	S	S	S	S	S	S	S	-
00N6882	FAStT500 Mini Hub	-	E	-	E	-	E	E	-	-	-	-	H	E
01K7296	FC Failsafe RAID Controller	-	-	-	-	-	S	S	H	S	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	S	-	-	-	-	E	E	-	E	H	-	-	-
2108R3S	SAN Data Gateway Router	S	-	-	-	-	S	S	-	S	-	-	-	-
2109S08	SAN FC Switch, 8-Port	S	E	S	E	S	E	E	E	-	E	E	E	E
2109S16	SAN FC Switch, 16-Port	S	E	S	E	S	E	E	E	-	E	E	E	E
SFCU1xx[3]	FC RAID Controller Unit	S	-	H	-	-	S	S	-	-	-	-	-	-
35L1647	SAN FC Managed Hub	S	E	S	E	S	-	-	E	E	E	E	E	-
19K11xx[5]	FAStT200 Storage Server	S	-	-	H	-	E	E	-	E	-	-	-	E
19K11xx[6]	FAStT200 HA Storage Server	S	-	-	-	-	E	E	-	E	-	-	-	E
00N69xx[2]	FAStT500 Storage Server	-	H	-	-	-	E	E	-	E	-	-	-	E
00N71xx[4]	FAStT EXP500 Storage Expansion Unit	-	E	-	E	-	-	-	-	-	E	E	E	E
03K9307	FC Long-Wave GBIC	-	H	-	H	-	H	H	H	H	H	H	H	H
03K9308	FC Short-Wave GBIC	-	H	-	H	-	H	H	H	H	H	H	H	H

S Short-wave connection only. See Fibre Device Ports Reference section for GBIC/Integrated port information.
L Long-wave connection only. See Fibre Device Ports Reference section for GBIC/Integrated port information
E Either Short-wave or Long-wave connections allowed. See Fibre Device Ports Reference section for GBIC/Integrated pinformation.
H Hardware connection. One of these devices installs directly into the other. i.e.: The FAStT500 Mini Hub (P/N 00N6882) installs directly into the FAStT500 Storage Server (P/N 00N69xx[5]) to provide GBIC availability

1. This device requires the use of GBICs. Purchase of GBICs may be needed in order to make connections to this device. See the Fibre Device Ports Reference section for GBIC/Integrated port information.
2. Where 'xx' represents a country specific code as follows:- 13=US/English, 14=Euro/English, 18=Denmark/English, 19=Israel/English, 20=Italy/English, 21=South Africa/English, 22=Switzerland/English, 26=UK/English. Country/Language - Line Cords/Publications are included as indicated
3. Where 'xx' = country publication and power cord codes as follows:- UK=United Kingdom and Arabia, DK=Denmark, IS=Israel, IT=Italy, SD=Saudi Arabia, SA=South Africa, SE=Switzerland/English, EU=countries not covered previously.
4. Where 'xx' represents a country specific code as follows:- 36=US/English, 37=Euro/English, 41=Denmark/English, 42=Israel/English, 43=Italy/English, 44=South Africa/English, 45=Switzerland/English, 49=UK/English. Country/Language - Line Cords/Publications are included as indicated
5. Where 'xx' represents a country specific code as follows:- 23=US/English, 24=Euro/English, 25=Euro/Spanish, 27=Euro/German, 28=Denmark/English, 29=Israel/English, 30=Italy/English, 31=South Africa/English, 32=Switzerland/English, 34=Switzerland/German, 36=UK/English. Country/Language - Line Cords/Publications are included as indicated
6. Where 'xx' represents a country specific code as follows:- 37=US/English, 38=Euro/English, 39=Euro/Spanish, 41=Euro/German, 42=Denmark/English, 43=Israel/English, 44=Italy/English, 45=South Africa/English, 46=Switzerland/English, 48=Switzerland/German, 50=UK/English. Country/Language - Line Cords/Publications are included as indicated.

Fibre Device Ports Reference

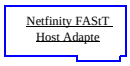
Part Number	Description	Total Connections Possible	Integrated Ports	Mini Hubs Possible	Mini Hubs Installed	GBIC Ports	GBICs Included
00N6881	FAStT Host Adapter	1	1	-	-	-	-
00N6882	FAStT500 Mini Hub[1]	2	-	-	-	2	-
01K7296	FC Failsafe RAID Controller	1	1	-	-	-	-
03K9307	FC Long-Wave GBIC	1	1	-	-	-	-
03K9308	FC Short-Wave GBIC	1	1	-	-	-	-
19K1121	FAStT200 Redundant RAID Controller	2	-	-	-	2	-
2108R3S	SAN Data Gateway Router[2]	1	1	-	-	-	-
2109S08	SAN FC Switch, 8-Port	8	-	-	-	8	4[3]
2109S16	SAN FC Switch, 16-Port	16	-	-	-	16	4[3]
SFCU1xx	FC RAID Controller Unit	1	1	-	-	-	-
35L1647	SAN FC Managed Hub	8	7	-	-	1	-
19K11xx	FAStT200 Storage Server	2	-	-	-	2	-
19K11xx	FAStT200 HA Storage Server	4	-	-	-	4	-
00N69xx	FAStT500 Storage Server	16[4]	-	8	4	8[1]	-
00N71xx	FAStT EXP500 Storage Expansion Unit	5	-	-	-	4	-

1. Each FAStT500 Mini Hub provides two GBIC ports.
2. Single-ended SCSI.
3. Included GBICs and integrated optical ports are short-wave.
4. FAStT500 Storage Server supports up to eight non-redundant or four redundant host connections and up to eight non-redundant or four redundant storage connections.

Supported Cable Groups	
Cable Group A (0.8 mm to 0.8 mm)	
03K9310	Netfinity 2 M Ultra2 SCSI Cable
03K9311	Netfinity 4.2 M Ultra2 SCSI Cable
37L7101	Netfinity 20 M Ultra2 SCSI Cable
Cable Group D (Short-Wave Fibre)	
36L9973	Netfinity Fibre Channel 1 M Cable
03K9306	Netfinity Fibre Channel 5 M Cable
03K9305	Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)	
Cable Group E (Long-Wave Fibre)	
Customer supplied long-wave cable of up to 10 kilometers (6.2 miles)	
GBIC	
03K9308	Netfinity Fibre Channel Short-Wave GBIC[1]
03K9307	Netfinity Fibre Channel Long-Wave GBIC

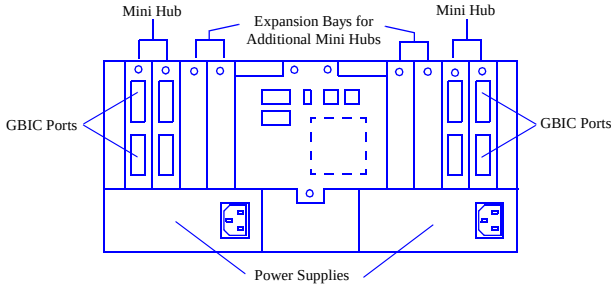
1. Four Netfinity Fibre Channel Short-Wave GBIC's (P/N 03K9308) are included with SAN Fibre Channel Switches (P/Ns 2109508 and 2109516).

FAStT Host Adapter
P/N 00N6881



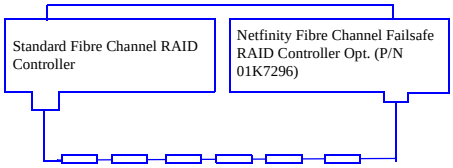
• PCI to FCAL 64/32-bit host adapter.
• Supported Attachments (use cable group D):
FAStT500 Storage Server
• Integrated short-wave optical port. No GBICs required.
•Full Fibre Channel Fabric support.

FAStT500 Storage Server
P/N 00N69xx



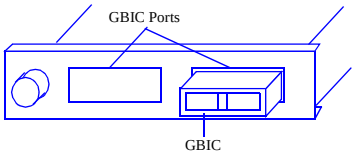
• Dual high-performance, RAID controller cards-supports up to 100 MB/sec data transfer rate per controller.
• Two 175 W auto-ranging, hot-swap, redundant power supplies.
• Attach directly to FAStT Host Adapter(s) (P/N 00N6881) with shortwave cables and GBICs or indirectly through SAN Fibre Channel Managed Hub (P/N 35L1647) using cables from cable group D or E with corresponding GBICs.
• Height is 4U (1 U = 1.75 in. or 44.45 mm)
• Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D Industry-Standard Rack. Mounting rails are included with the controller.
• For optimum performance no more than two FAStT500 Storage Servers (P/N 00N69xx) should be attached to a single hub (P/N 35L1647)
• Includes four FAStT500 Mini Hubs (P/N 00N6882), two for host and two for storage.
• FAStT500 256 MB Cache (P/N 00N6883) expansion is required in installations where a large number of devices are supported.
• All connections to FAStT500 Mini Hubs require the use of GBICs. GBICs not included.

Fibre Channel RAID Controller Unit
P//N SFCU1xx)



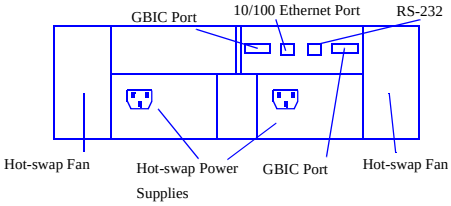
• Contains a single Short-Wave Fibre Connection (use cable group D) and six female 0.8 mm Very High Density Connection Interface (VHDCI) SCSI connectors
• Hot-Swap Redundant Fans and Power Supplies
• Optional Netfinity Fibre Channel Failsafe RAID Controller (P/N 01K7296) provides a redundant RAID controller and second Short-Wave Fibre Connection (use cable group D)
• Attach directly to FAStT Host Adapter(s) (P/N 00N6881) or indirectly through SAN Fibre Channel Managed Hub (P/N 35L1647) using cables from cable group D.
• Height is 4 U (1 U=1.75 in. or 44.45 mm)
• Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D Industry-Standard Rack. Mounting rails are included with the controller.
• For optimum performance no more than two RAID controller units P/N SFCU1xx should be attached to a single hub

FAStT500 Mini Hub
P/N 00N6882



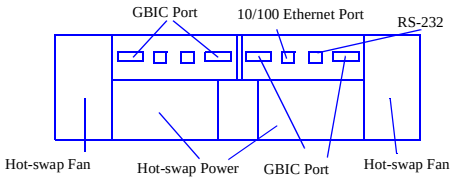
• Provides additional connections to the Netfinity FAStT500 Storage Server - supports complex clustering or advanced storage applications.
• All connections to FAStT500 Mini Hubs require the use of GBICs. GBICs are not included.

FAStT200 Storage Server P/N 19K11xx



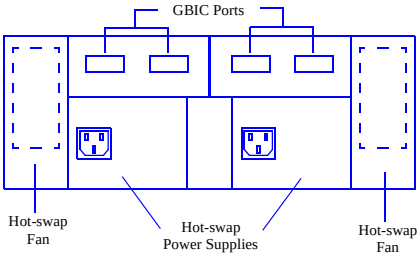
• Contains a single hot-plug, RAID controller which provides a single host Fibre Channel arbitrated loop and a single storage Fibre Channel arbitrated loop.
• Can be upgraded to a FAStT200 HA Storage Server through the addition of a FAStT200 Redundant RAID Controller (P/N 19K1121).
• Integrated 10/100 Mbps Ethernet connector and RS-232 service support port.
• Performance optimised for 30 disk drives - supports optional FAStT EXP500 Storage Expansion Units (P/N 00N71xx).
• Two hot-swap 350 W auto-ranging, redundant power supplies.
• Redundant fans - two hot-swap, dual-fan units.
• LED indicators on all critical components warn of faults, over temperature, and other abnormalities.
• Ten drive bays - supports slim-high or half-high Fibre Channel hot-swap hard disk drives.
• Height is 3U (1U= 1.75 in or 44.45 mm.
•Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D industry standard rack. Mounting rails are included with the controller.
• Support long- and short-wave connections. Requires optional GBICs for each connection. GBICs not included.

FAStT200 HA Storage Server P/N 19K11xx



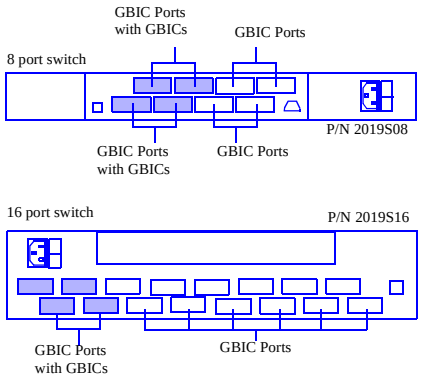
• Contains two hot-plug, RAID controllers. Each controller provides a single host Fibre Channel arbitrated loop and a single storage Fibre Channel arbitrated loop.
• Integrated 10/100 Mbps Ethernet connector and RS-232 service support port.
• Performance optimised for 30 disk drives- supports optional FAStT EXP500 Storage Expansion Units (P/N 00N71xx).
• Two hot-swap 350 W auto-ranging, redundant power supplies.
• Redundant fans - two hot-swap, dual-fan units.
• LED indicators on all critical components warn of faults, over temperature, and other abnormalities.
• Ten drive bays - supports slim-high or half-high Fibre Channel hot-swap hard disk drives.
• Height is 3U (1U= 1.75 in or 44.45 mm.
•Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D industry standard rack. Mounting rails are included with the controller.
• Support long- and short-wave connections. Requires optional GBICs for each connection. GBICs not included.

FAStT EXP500 Storage Expansion Unit P/N 00N71xx



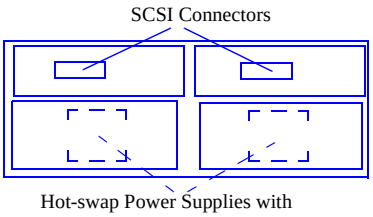
- Two hot-swap, 350 W auto-ranging, redundant power supplies.
- Redundant fans - two hot-swap, dual-fan units.
- LED indicators on all critical components warn of faults, over temperature, and other abnormalities.
- Ten drive bays - supports slim-high or half-high Fibre Channel hot-swap hard disk drives.
- Height is 3U (1 U = 1,75 in. or 44.45 mm)
- Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D Industry-Standard Rack. Mounting rails are included with the controller.
- Requires optional GBICs for each connection. GBICs not included.

SAN Fibre Channel Switch, 8 or 16 Ports P/Ns 2109S08, 2109S16



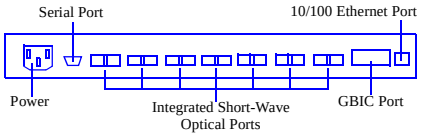
- Each port delivers up to 100 MB/sec, full-duplex data transfer.
- Comes with 4 Short-Wave GBICs installed.
- Embedded Web browser configuration, management and service.
- Support for Public Fibre Channel Arbitrated Loops.
- Optional power supply (P/N 09L5403) available.
- The 8 port switch is 1 U (1 U=1.75 in. or 44.45 mm) high and the 16 port switch is 2 U (1 U=1.75 in. or 44,45 mm) high.

EXP300 Storage Expansion Unit P/N 19K11xx



- Fourteen slim-high drive bays.
- Supports Ultra160 SCSI data transfer speeds - up to 160 MB/s.
- Single or dual SCSI bus configurations.
- Dual hot-swap 500 W redundant power supplies with integrated fan assemblies.
- Height is 3 U (1 U=1.75 in. or 44.45 mm).
- Tower capability through optional Rack-to-Tower Conversion Kit.
- Requires Netfinity Enterprise Rack or Expansion Cabinet, Netfinity Rack, Netfinity NetBAY22 or 19-inch EIA-D Industry-Standard Rack. Mounting rails are included with the controller.

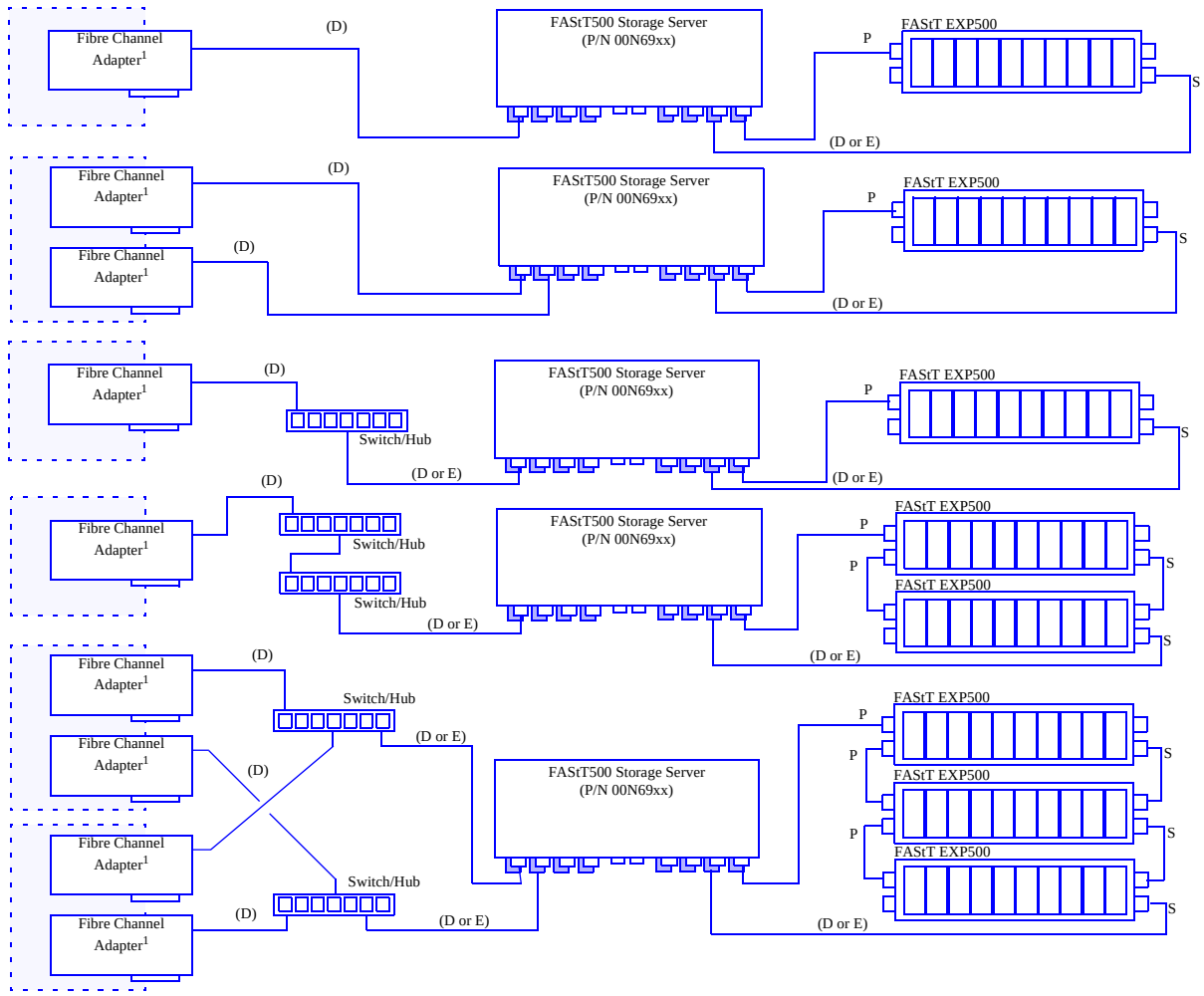
SAN Fibre Channel Managed Hub P/N 35L1647



- High-speed performance utilising nonblocking switch-based technology.
- Simultaneous 100 MB/sec full duplex data transfers across all ports.
- Eight ports, one that is configurable with either a short-wave or long-wave optical GBIC.
- Support for industry standard MIBs enabling standard SNMP management.
- Height is 1 U (1 U=1.75 in. or 44.45 mm) high.

Fibre / Fibre Configuration Examples

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.



Shaded boxes represent separate hosts.

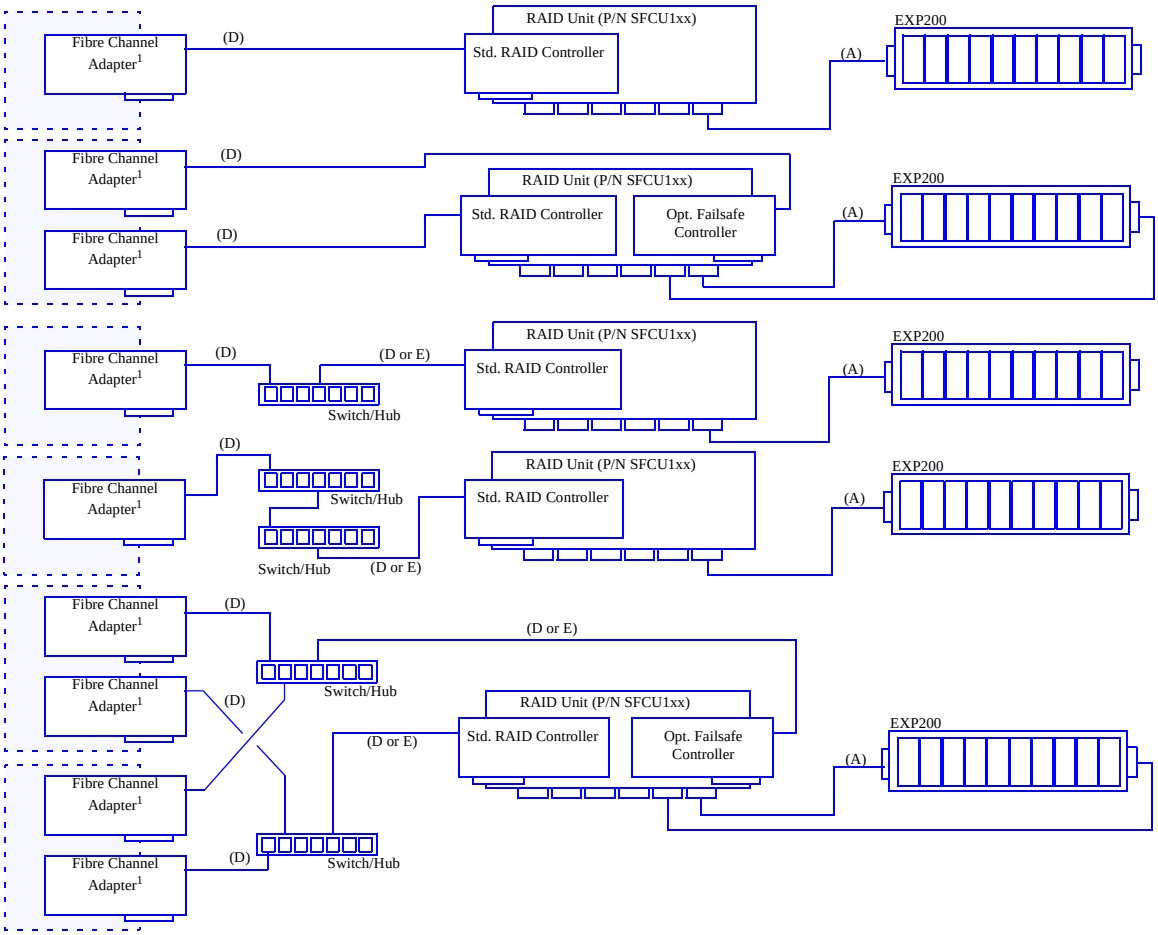
1. FAStT Host Adapter (P/N 00N6881) supports shortwave connections only.

P = Primary path, S = Secondary/Redundant path
All storage connections require a secondary/redundant pathway in order to function properly.

(D), (E) = Cable Groups used, refer to chart on earlier page in this section for more information

Fibre / SCSI Configuration Examples

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.



Shaded boxes represent separate hosts.

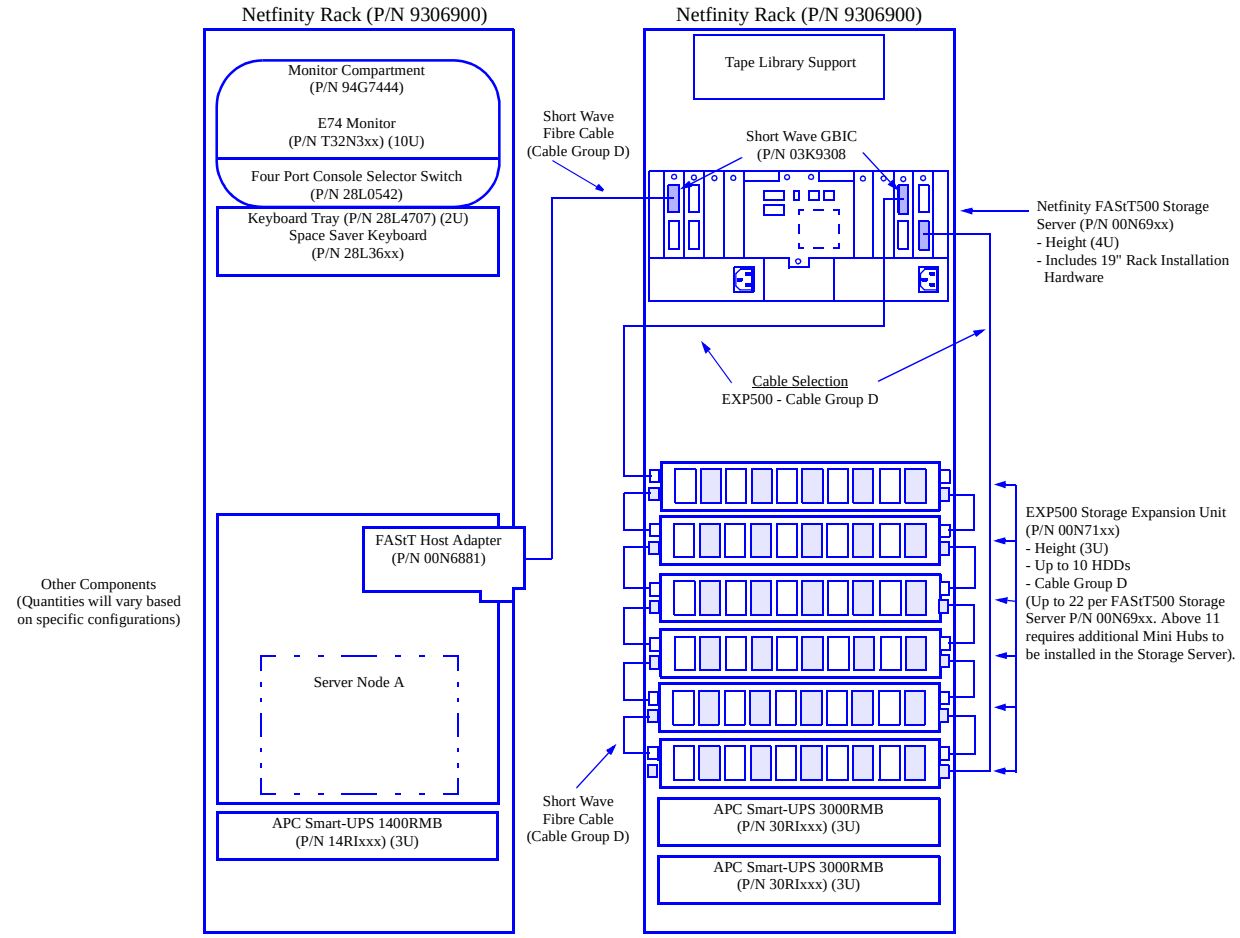
1. Configured as two independent 5 HDD buses.

(D), (E) = Cable Groups used, refer to chart on earlier page in this section for more information

IBM Netfinity Fibre Array Solutions

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements

High-speed single-node Netfinity Fibre Channel Storage configuration offering performance, bandwidth & capacity



Connector Types
68-pin - High Density Connector
0.8 mm - Very High Density Connection Interface VHDCI

Cable Group A (0.8 mm to 0.8 mm)
03K9310 - Netfinity 2 M Ultra2 SCSI Cable
03K9311 - Netfinity 4.2 M Ultra2 SCSI Cable
37L7101- Netfinity 20 M Ultra2 SCSI Cable

Cable Group D (Short-Wave Fibre)
36L9973 - Netfinity Fibre Channel 1 M Cable
03K9306 - Netfinity Fibre Channel 5 M Cable
03K9305 - Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)

Cable Group E (Long-Wave Fibre)
Customer supplied long-wave cable of up to 10 kilometers (6.2 miles)

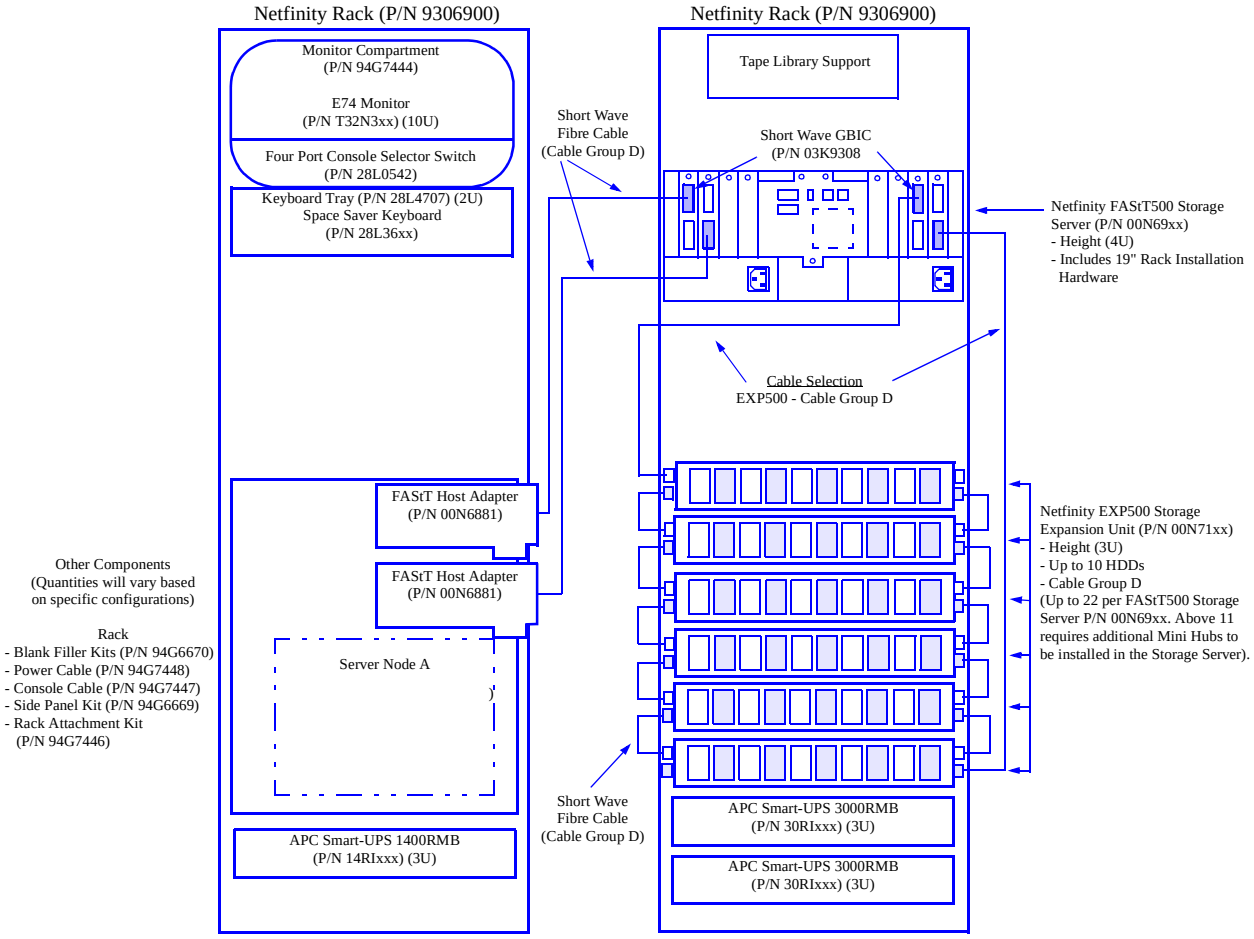
GBIC
03K9308 - Netfinity Fibre Channel Short-Wave GBIC[1]
03K9307 - Netfinity Fibre Channel Long-Wave GBIC

1. Four Netfinity Fibre channel Short-Wave GBIC's (P/N 03K9308) are included with SAN Fibre Channel Managed Hub (P/N 35L1647)

IBM Netfinity Fibre Array Solutions

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements

High-speed single-node Netfinity Fibre Channel Storage configuration with Microsoft NT failover support and RAID redundancy for availability, performance, capacity



Connector Types
68-pin - High Density Connector
0.8 mm - Very High Density Connection Interface VHDCI

Cable Group A (0.8 mm to 0.8 mm)
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03K9311 - Netfinity 4.2 M Ultra2 SCSI Cable
37L7101 - Netfinity 20 M Ultra2 SCSI Cable

Cable Group D (Short-Wave Fibre)
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03K9306 - Netfinity Fibre Channel 5 M Cable
03K9305 - Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)

Cable Group E (Long-Wave Fibre)
Customer supplied long-wave cable of up to 10 kilometers (6.2 miles)

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03K9307 - Netfinity Fibre Channel Long-Wave GBIC

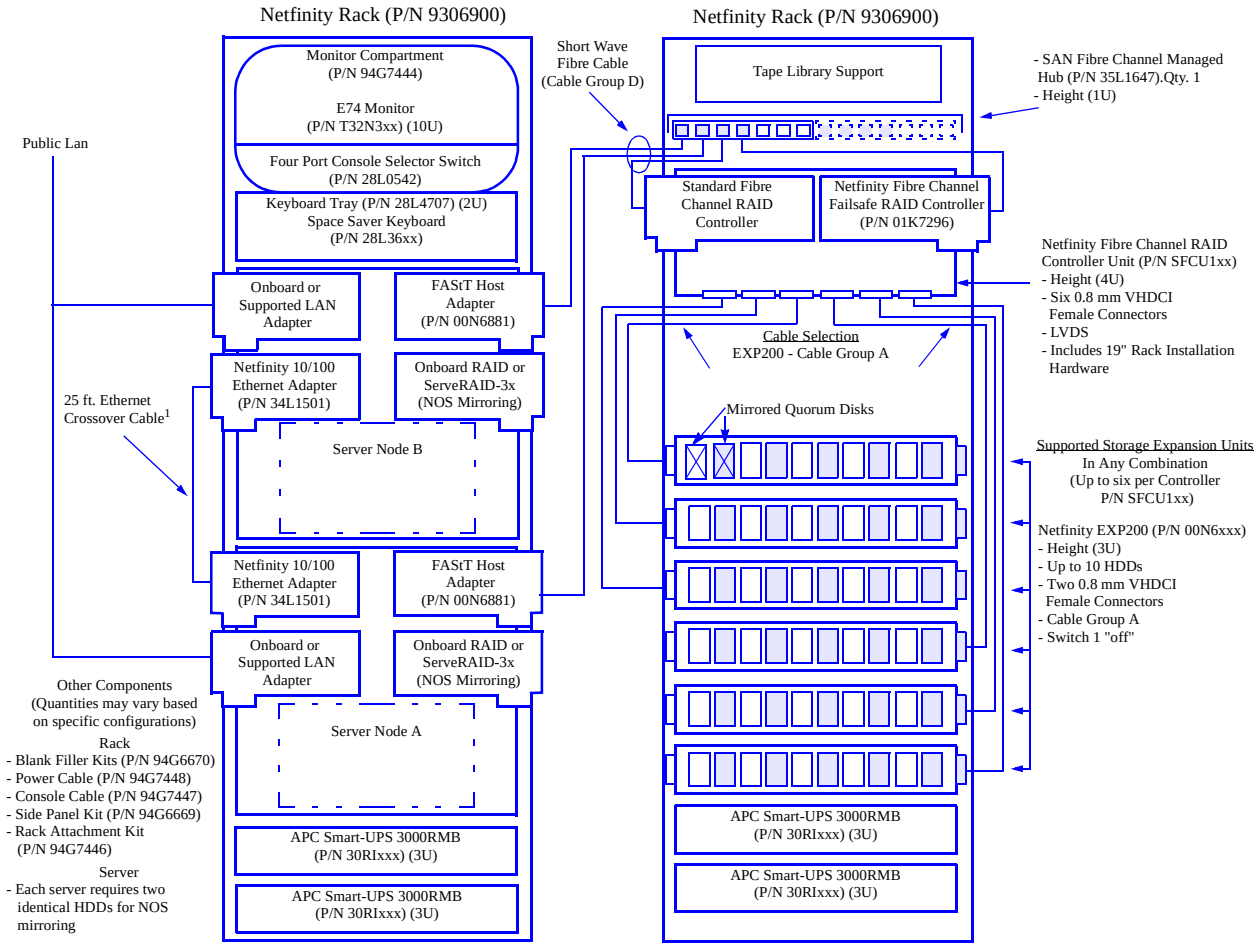
1. Four Netfinity Fibre channel Short-Wave GBIC's (P/N 03K9308) are included with SAN Fibre Channel Managed Hub (P/N 35L1647).

IBM Netfinity Fibre Array Solutions

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements

Cluster Solution

High speed multiple node Microsoft Cluster Service (MSCS) and Netfinity Fibre Channel Storage configuration offering data protection and RAID redundancy.



Connector Types
68-pin - High Density Connector
0.8 mm - Very High Density Connection Interface VHDCI

Cable Group A (0.8 mm to 0.8 mm)
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03K9311 - Netfinity 4.2 M Ultra2 SCSI Cable
37L7101 - Netfinity 20 M Ultra2 SCSI Cable

Cable Group D (Short-Wave Fibre)
36L9973 - Netfinity Fibre Channel 1 M Cable
03K9306 - Netfinity Fibre Channel 5 M Cable
03K9305 - Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)

Cable Group E (Long-Wave Fibre)
Customer supplied long-wave cable of up to 10 kilometers (6.2 miles)

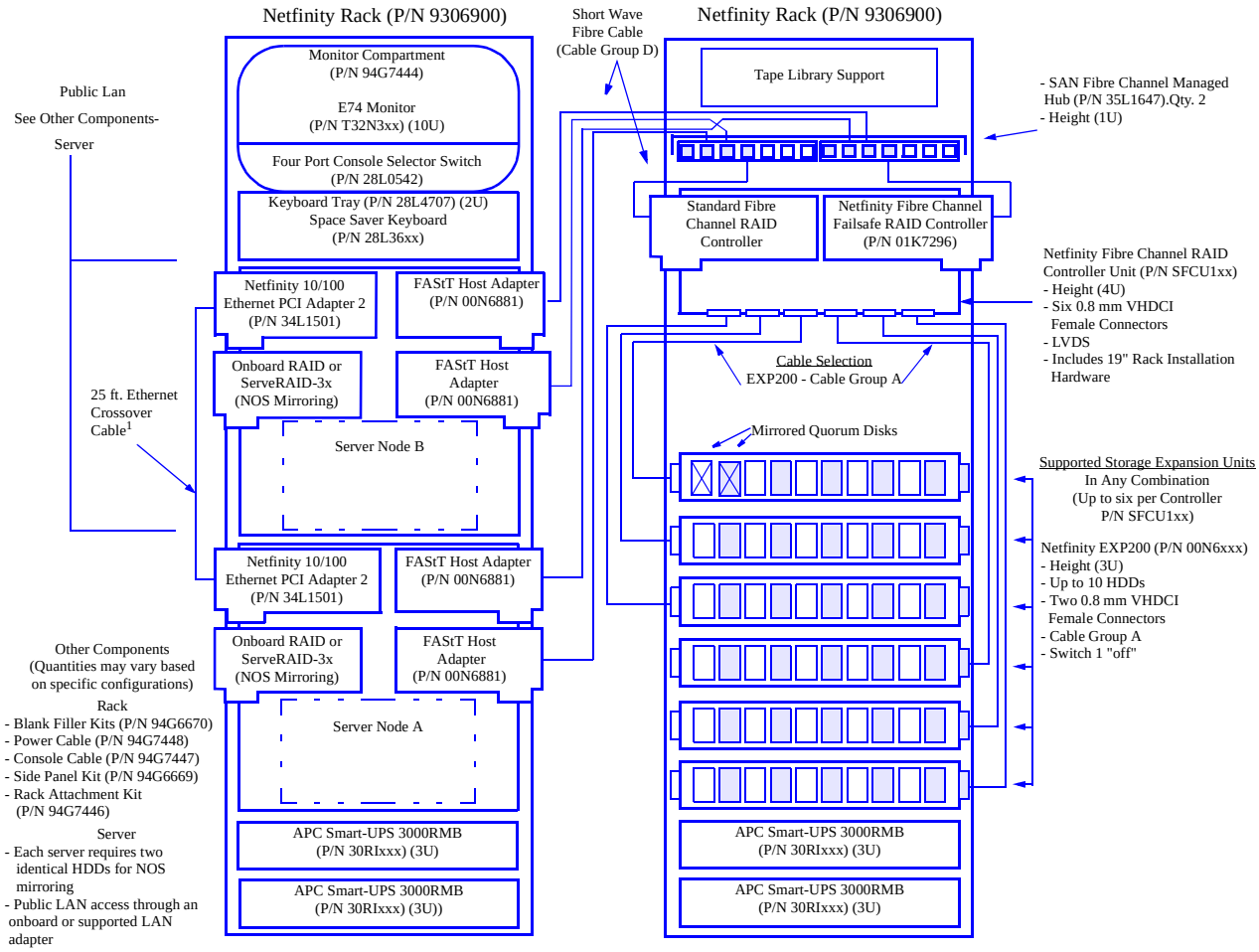
GBIC
03K9308 - Netfinity Fibre Channel Short-Wave GBIC[1]
03K9307 - Netfinity Fibre Channel Long-Wave GBIC

1. Microsoft Cluster Server (MSCS) requires a private interconnect between clustered nodes. A 25 ft. Ethernet crossover cable is shown but not available from IBM as a separate option. Contact your IBM Business Partner for assistance.

IBM Netfinity Fibre Array Solutions

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements

Advanced high-speed high-availability multiple node Microsoft Cluster Service (MSCS) and fully redundant Netfinity Fibre Channel Storage configuration offering the highest levels of data protection and availability and access to data



Connector Types
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37L7101 - Netfinity 20 M Ultra2 SCSI Cable

Cable Group D (Short-Wave Fibre)
36L9973 - Netfinity Fibre Channel 1 M Cable
03K9306 - Netfinity Fibre Channel 5 M Cable
03K9305 - Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)

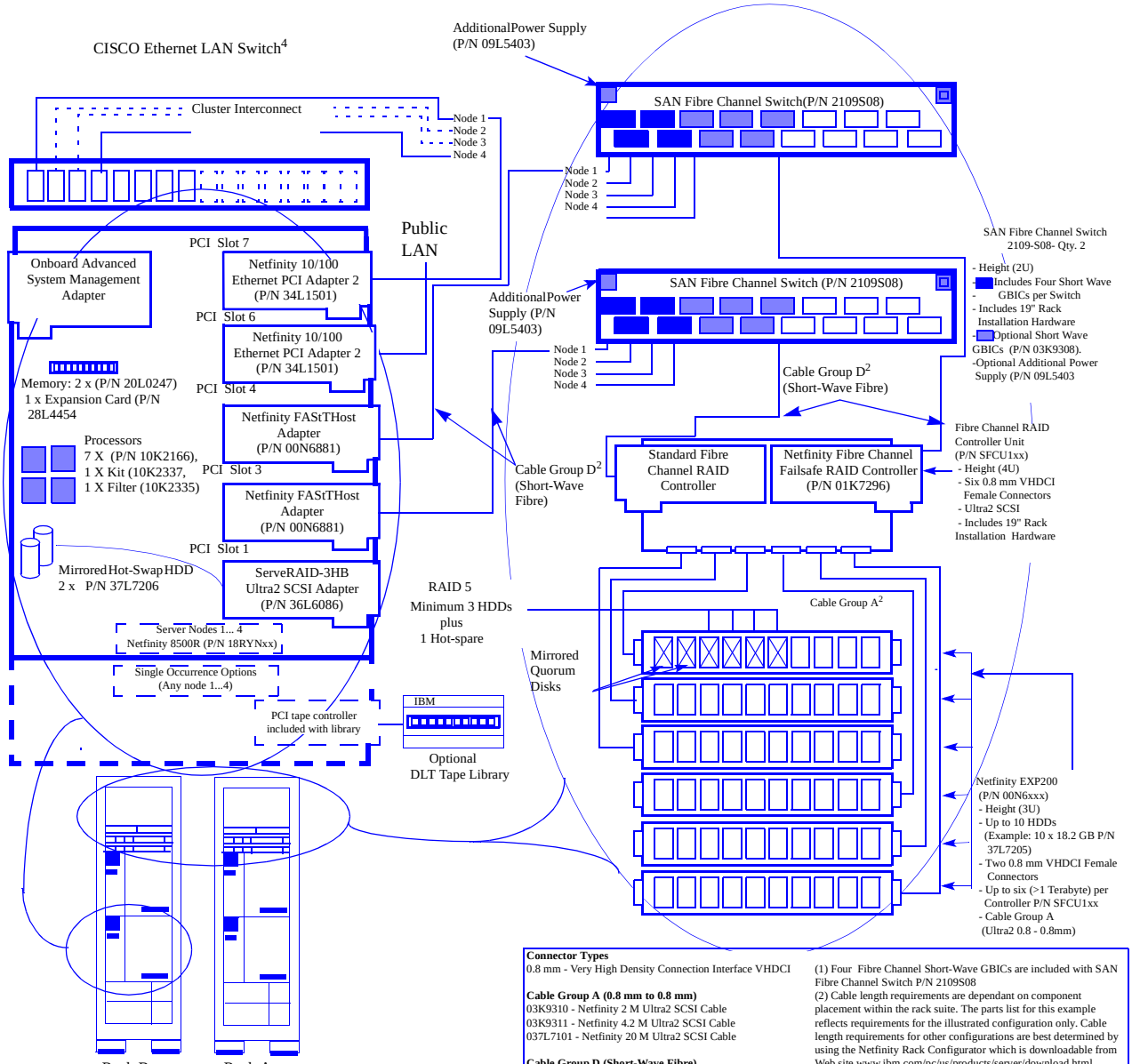
Cable Group E (Long-Wave Fibre)
Customer supplied long-wave cable of up to 10 kilometers (6.2 miles)

GBIC
03K9308 - Netfinity Fibre Channel Short-Wave GBIC[1]
03K9307 - Netfinity Fibre Channel Long-Wave GBIC

1. Microsoft Cluster Server (MSCS) requires a private interconnect between clustered nodes. A 25 ft. Ethernet crossover cable is shown but not available from IBM as a separate option. Contact your IBM Business Partner for assistance.

Netfinity Availability Extensions for NT 4.0 MSCS Four Node Cluster

Note: - The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Customer specific MSCS configurations require IBM approval. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.



Rack B
Tape
FC Switch
FC Switch
EXP200
EXP200
EXP200
8500R
8500R
5000 UPS
5000 UPS

Rack A
RAID Controller
EXP200
EXP200
8500R
Flat Panel Monitor
Keyboard
Console Switch
8500R
5000 UPS
5000 UPS

Connector Types
0.8 mm - Very High Density Connection Interface VHDCI

Cable Group A (0.8 mm to 0.8 mm)
03K9310 - Netfinity 2 M Ultra2 SCSI Cable
03K9311 - Netfinity 4.2 M Ultra2 SCSI Cable
037L7101 - Netfinity 20 M Ultra2 SCSI Cable

Cable Group D (Short-Wave Fibre)
03K9306 - Netfinity Fibre Channel 5 M Cable
03K9305 - Netfinity Fibre Channel 25 M Cable
Customer supplied short-wave cable of up to 500 meters (0.31 miles)

GBIC
03K9308 - Netfinity Fibre Channel Short-Wave GBIC[1]
03K9307 - Netfinity Fibre Channel Long-Wave GBIC

(1) Four Fibre Channel Short-Wave GBICs are included with SAN Fibre Channel Switch P/N 2109S08
(2) Cable length requirements are dependant on component placement within the rack suite. The parts list for this example reflects requirements for the illustrated configuration only. Cable length requirements for other configurations are best determined by using the Netfinity Rack Configurator which is downloadable from Web site www.ibm.com/pc/us/products/server/download.html
(3) A tape library is optional and attaches to any one of the nodes within the cluster.
(4) Please contact your NAE Specialist in Advanced Technical Support about the most up-to-date Cluster interconnect requirements.

Additional Information and Configuration Tools Available
See "Information Sources" section for Clustering, Server Paper Configurator, ConfigXpert and Netfinity Rack Configurator URLs

Netfinity Availability Extensions for NT4.0 MSCS Four Node Cluster - Parts List[1]

Note: The following sample configurations are for illustration only and may not be suitable for any specific customer installation. Customer specific MSCS configurations require IBM approval. Contact your IBM Business Partner or IBM Marketing Representative for assistance with your specific configuration requirements.

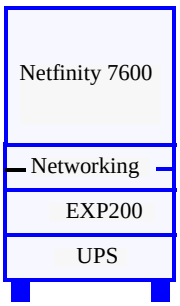
Part Number	Description	Qty.	Usage
18RYNxx	Netfinity 8500R-700 MHz/2 Mb L2, 512k Mb RAM	4	Cluster Nodes
10K2335	Netfinity 4x Accelerator Filter	4	
10K2337	Netfinity Mezzanine Expansion Kit	4	Allows expansion to 8 SMP processors.
10K2166	Netfinity 8500R 700 MHz/ 2 Mb Upgrade with Pentium III Xeon Processor	28	7 per node, total of 8 SMP processors per node
37L7206	36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL HDD	8	2 per node, mirrored NOS, attached to ServeRAID
36L6086	IBM Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	4	1 per node for NOS HDDs. Install in PCI slot 1
34L1501	Netfinity 10/100 Ethernet PCI Adapter 2	8	Public LAN - slot 6/ interconnect slot 7
00N6881	Netfinity FAStT Host Adapter	8	2 per node, each attaches to one of the two Fibre Hubs. Install in PCI slots 3 and 4.
37L0xxx	Netfinity EXP200 350 W Redundant Power Supply II	4	1 per node, provides power supply redundancy for each node
20L0247	256 MB ECC SDRAM RDIMM II Memory	8	2 per node to increase memory to 1GB
28L4454	Netfinity Memory Expansion Card	4	1 per node, to expand for additional memory
02K65xx	UltraSlim 56 W AC Adapter	4	Provides an independent backup power source for systems management
	Storage Subsystems		
2109S08	SAN Fibre Channel 8 Port Switch	2	Redundant short-wave (SW) connections from each of four nodes to Netfinity Fibre Channel RAID Controller Unit. Each switch includes four standard SW BBICs
09L5403	Additional Power Supply	2	Hot-Swap redundant power supply for SAN Fibre Channel Switch
03K9308	Netfinity Fibre Channel Short-Wave GBIC	10	8 for adapters and 2 for switches
SFCU1xx	Netfinity Fibre Channel RAID Controller Unit	1	Attaches to 6 EXP200s, with Failsafe Controller - two attachments to the hubs
01K7296	Netfinity Fibre Channel Failsafe RAID Controller	1	Installs in Controller Unit, providesredundant path to EXP200s
00N6xxx	Netfinity EXP200 Storage Expansion Unit	6	One LVDS attachment to RAID Controller Unit per EXP200, max, of 60 HDDs
37L7206	Netfinity EXP 36,4 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	58	A minimum of four RAID 5 HDDs(3 plus a hot-spare) with a maximum of 58
37L7204	Netfinity EXP 9.1 GB 10K-4 Ultra160 SCSI Hot-Swap HDD	2	Mirrored Quorum HDDs
00N79xx	DLT Tape Library	1	Tape subsystems are optional. The 3502R14 includes a 3 M cable and PCI controller
37L6862	APC Smart-UPS 5000RMB[2]	4	Power connections are intra-rack only[2]
	Storage Cables		
03K9306	Netfinity Fibre Channel 5 M Cable	10	2 x 4 nodes to hub, 2 hub to RAID controllers
03K9310	Netfinity 2 M Ultra2 SCSI Cable	3	RAID controller to EXP200s
03K9311	Netfinity 4.2 M Ultra2 SCSI Cable	3	RAID controller to EXP200s
	Internet Components		
-	CISCO Ethernet Switch[4]	1	Standard configuration supports interconnection up to 4 nodes
-	Standard CAT5 Cables[4]	8	2 per node for cluster interconnect/network access
	Other Non-Rack		
Customer Supplied	Ethernet System Management Cables	8	Provides interconnection between Advanced System Management Adapters.
28L36xx	Space Saver II Keyboard (1U)	1	Includes TrackPoint
11AG1xx	Flat Panel Monitor	1	
37L6888	Flat Panel Monitor Adapter	1	

Rack / Related			
930842P	Netfinity Enterprise Rack	1	Provides 42U of mounting space per rack
930842X	Netfinity Enterprise Expansion Cabinet	1	Provides 42U of additional mounting space
28L4707	Netfinity Rack Keyboard Tray	1	Allows keyboard 28L3640 to be stowed in a ready-to-use position
28L0542	Netfinity Console Selector Switch (4-port)	1	Connects 4 nodes to 4-port switch
94G7448	Power Cable - TypeC12	15	Provides power cables for UPS attachment to installed components
94G7447	NetBAY 12ft. Console Cable Set	4	Attaches each node to the console switch.
Netfinity Availability Extensions for MSCS[3]			
36L9891	Netfinity Availability Extensions for MSCS (3 node)[5]	1	License for first 3 nodes
36L9892	Netfinity Availabilty Extensions for MSCS (1 additional node)[5]	1	License for last additional node (4th)

1. Cable, power, cooling and weight are dependent on component placement within the rack and rack suite. This parts list reflects one possible configuration of the listed components. Prior to ordering, you should configure your specific environment using the Netfinity Rack Configurator. The Netfinity Rack Configurator is downloadable from URL: www.ibm.com/pc/us/products/server/download.html.
2. Pre-installation site planning information: P/N 34L6862 contains four L6-30P, 220V 30 amp circuitry.
3. Consists of Netfinity Availability Extensions for MSCS software licenses (support for up to four nodes) and installation services for the complete Netfinity solution being installed. Netfinity Availabilty Extensions for MSCS is available through IBM Direct as a solution offering and is designed for installation by trained service personnel. Please contact your IBM representative for ordering information.
4. Please contact your IBM representative about the most up-to-date Cluster Interconnect requirements.
5. Netfinity Availability Extensions for MSCS(NAE) require NAE Service Pack 3.

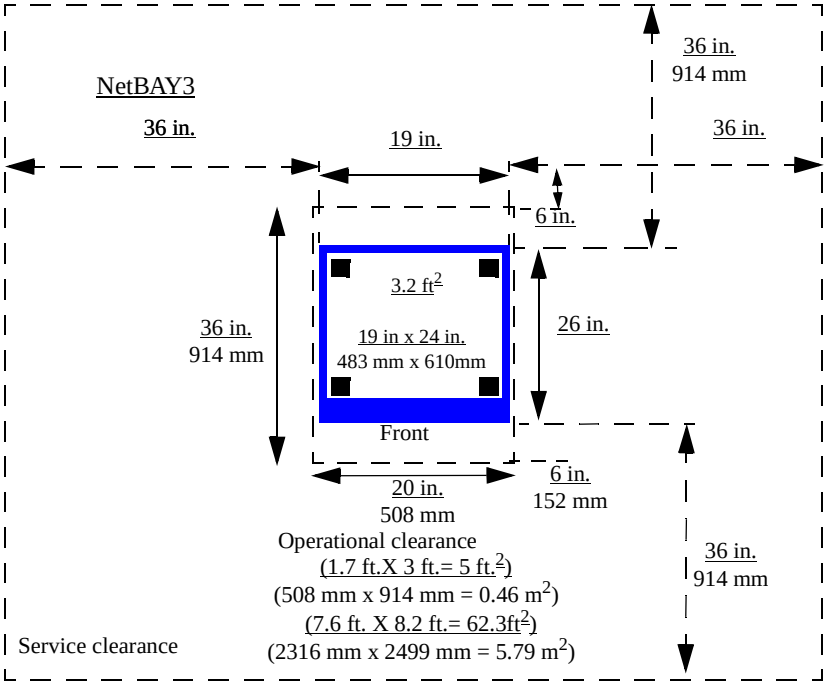
IBM Netfinity NetBAY3/NetBAY3E Stackable Enclosure

Sample Configuration



Installation Guidelines:

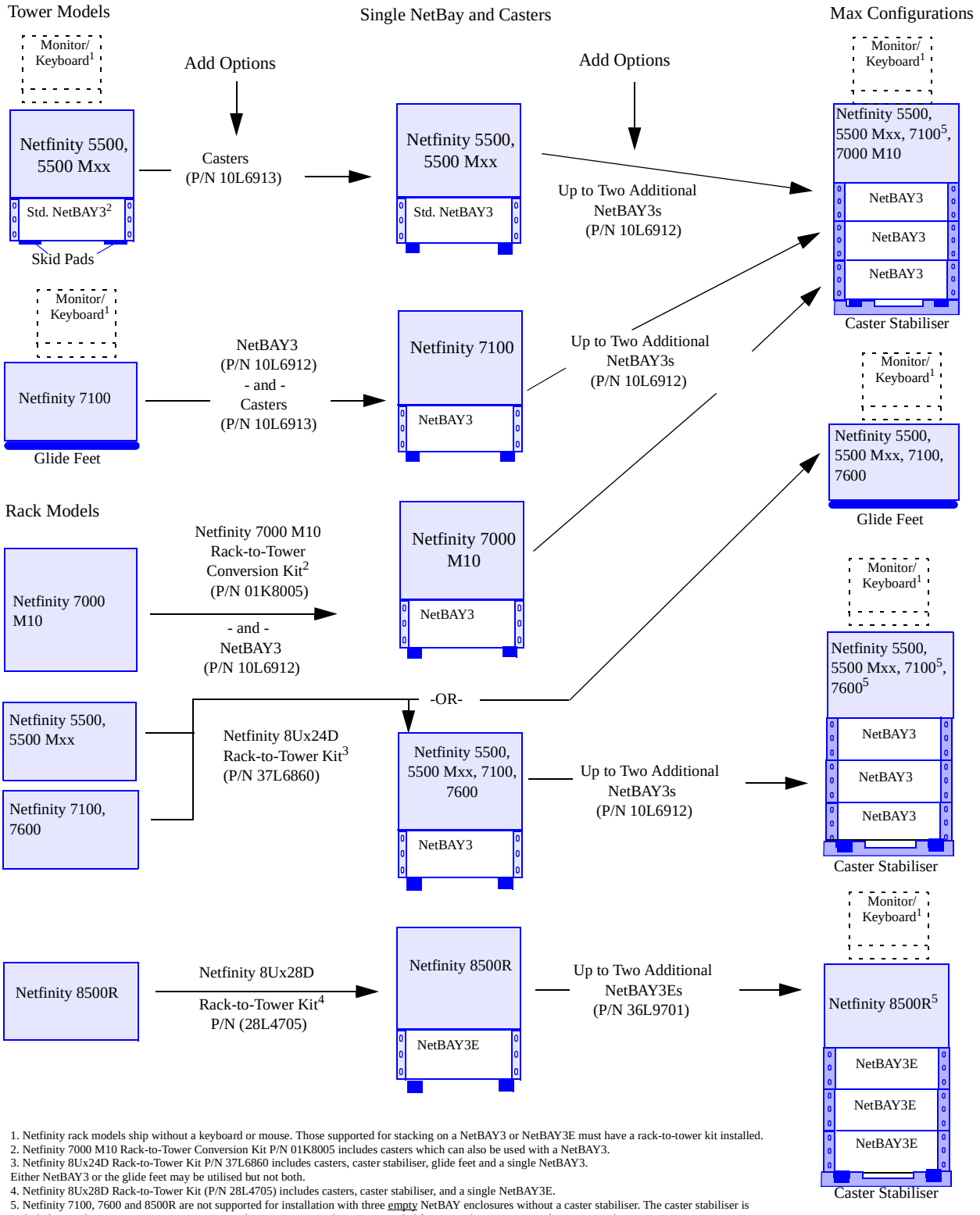
1) Locate power units with line cords in the bottom enclosure.
2) Install components starting from the bottom; start with the heaviest device.
3) If nothing is installed in the enclosure, attach the rear blank panel for stability.



Supported Devices	NetBAY3	NetBAY3E	Size (U)	Weight(lb/kg)	Max/Enclosure	Max/Stack
Servers						
Netfinity 7600[1]	X	-	-	120/54.4	n/a	1
Netfinity 7100	X	-	-	120/54.4	n/a	1
Netfinity 7000-M10[2]	X	-	-	160/72.6	n/a	1
Netfinity 5500	X	-	-	120/54.4	n/a	1
Netfinity 5500-Mxx	X	-	-	123.4/56.0	n/a	1
Netfinity 8500R[3]	-	X		170/77.1	n/a	1
Expansion[4]						
Netfinity EXP200	X	X	3	80/36	1	3
Tape Units[4]						
NetMEDIA	X	X	3	37/17	1	3
Power[4]						
APC Smart-UPS 1400RMiB	X	X	3	55/24.9	1	1
APC Smart-UPS 3000RMiB	X	X	3	112/50.8	1	1
200-240V PDU	X	X	1	8/3.6	1	1
Networking[4]						
2210 Multiprotocol Router	X	X	1, 2	7/3.2, 20/9.1	3, 1	9, 3
8230 T-R Controlled Access Unit	X	X	2	15/6.8	1	3
8235 Dial-in Access to LANs	X	X	1	8/3.6	3	9
8237 Ethernet Hub	X	X	2	10/4.5	1	3
8238 Nways T-R Hub	X	X	2	11/5.0	1	3
8271 Ethernet Switch	X	X	2	16/7.3	1	3
8272 T-R Switch	X	X	2	16/7.3	1	3
8285 ATM Switch	X	X	3	70/31.8	1	3

1. Netfinity 7600 systems are rack mountable and ship without a keyboard or mouse. In order to be utilised with a NetBAY3 or in a tower configuration, optional 8Ux28D Rack-to-Tower Kit (P/N 28L4705) must be installed.
2. Netfinity 7000-M10 systems are rack mountable and ship without a keyboard. In order to be utilized with a NetBAY3 or in a tower configuration, optional Rack-to-Tower Conversion Kit (P/N 01K8005) must be installed.
3. Netfinity 8500R systems are rack mountable and ship without a keyboard. In order to be utilized with a NetBAY3E or in a tower configuration, optional Rack-to-Tower Kit (P/N 28L4705) must be installed.
4. NetBAY3 and NetBAY3E do not contain a top cover and therefore require a supported server as the top component in a stack

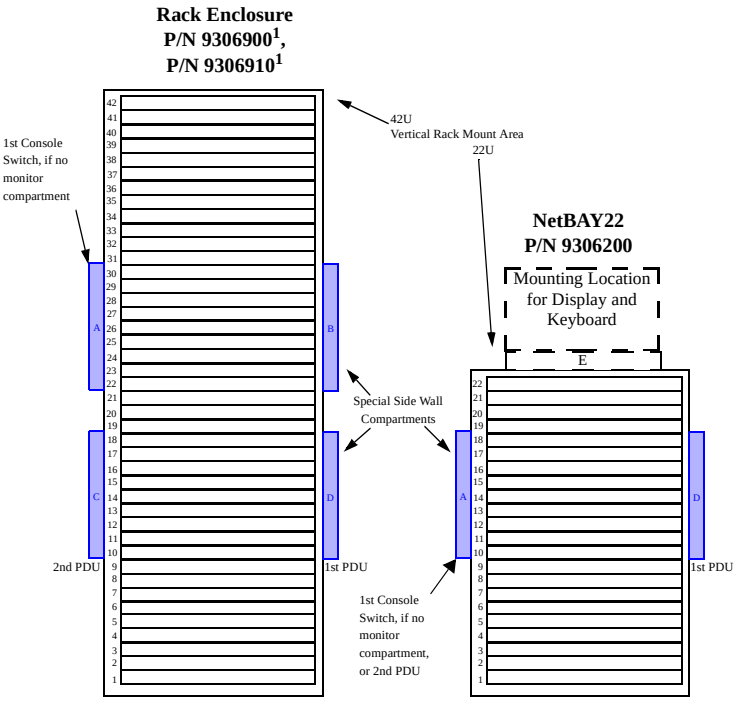
IBM Netfinity NetBAY3/3E Stackable Enclosure



1. Netfinity rack models ship without a keyboard or mouse. Those supported for stacking on a NetBAY3 or NetBAY3E must have a rack-to-tower kit installed.
2. Netfinity 7000 M10 Rack-to-Tower Conversion Kit P/N 01K8005 includes casters which can also be used with a NetBAY3.
3. Netfinity 8Ux24D Rack-to-Tower Kit P/N 37L6860 includes casters, caster stabiliser, glide feet and a single NetBAY3.
Either NetBAY3 or the glide feet may be utilised but not both.
4. Netfinity 8Ux28D Rack-to-Tower Kit (P/N 28L4705) includes casters, caster stabiliser, and a single NetBAY3E.
5. Netfinity 7100, 7600 and 8500R are not supported for installation with three empty NetBAY enclosures without a caster stabiliser. The caster stabiliser is included in Rack-to-Tower Kits P/N 37L6860 and P/N 28L4705 and is recommended for use with any quantity of NetBAY enclosures.

IBM Netfinity Rack Cabinet and Options

Note: For a robust rack configurator application access URL http://www.pc.ibm.com/europe/configurators



1. P/N 9306900 includes a glass front door and no side panels.
P/N 9306910 includes a perforated front door and side panels.

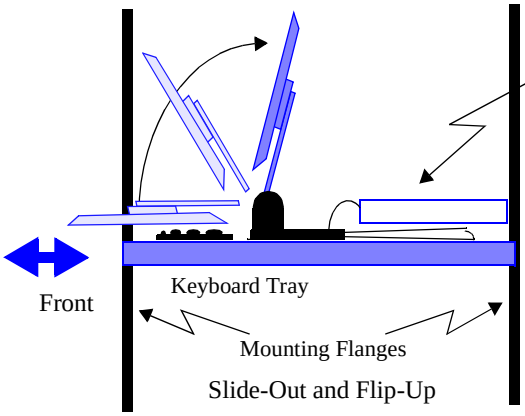
Direct Rack Mount[1]: Units Supported Examples		
IBM Servers		
Netfinity 4000R	All Models	1U[3]
xSeries 330	All Models	1U[4]
xSeries 340 / Netfinity 4500R	All Models	3U
xSeries 230 / Netfinity 5100	Rack Models	5U
xSeries 240 / Netfinity 5600	Rack Models	5U
Netfinity 6000R	All Models	5U
Netfinity 7100	Rack Models	8U
Netfinity 7600	All Models	8U
Netfinity 8500R	All Models	8U[2]
IBM Storage Expansion Units		
Netfinity EXP15	P/N SE2RXxx	3U
Netfinity EXP200	P/N 00N6xxx	3U
Netfinity EXP300	P/N 19K11xx	3U
IBM Fibre Solutions		
RAID Controller Unit	P/N SFCU1xx	4U
FAStT500 Storage Server	P/N 00N69xx	4U
FAStT500 EXP500 Expansion Unit	P/N 00N71xx	3U
SAN FC Managed Hub	P/N 35L1647	1U
8-port Switch	P/N 2109S08	1U
16-port Switch	P/N 2109S16	2U
FAStT200 Storage Server	P/N 19K11xx	3U
IBM Tape Unit Enclosures		
NetMEDIA Enclosure	P/N 03K8756	3U
IBM Networking Products		
Dial-in Access to LANS	8235-03x	1U

New Rack Options	
09N4290	NetBAY 1x4 Console Switch
09N4291	NetBAY 2x8 Console Switch
09N4293	NetBAY 7-foot Console Cable Set
37L68xx[1]	NetBAY Server Dual Cord Power Distribution Unit
37L68xx[2]	NetBAY Rack Power Distribution Unit
37L6885	NetBAY Single Phase Front-End Power Distribution Unit
37L6883	NetBAY Single Phase Front-End Power Distribution Unit with 120V Line Cord
37L6887	NetBAY Three Phase Front-End Power Distribution Unit

1. Where xx provides a country line cord: 65=US, 67=EUR, 69=Den/Switz, 71=Israel, 73=Italy, 65=Saudi Arabia, 75=S/Africa, and P/N 06P6027=UK.
2. Where xx provides a country line cord: 66=US, 68=EUR, 70=Den/Switz, 72=Israel, 74=Italy, 66=Saudi Arabia, 76=S/Africa, and P/N 06P6028=UK.

1. Mounting hardware provided with product
2. Netfinity 8500R requires installation of extension kit P/N 36L9703 or 36L9702 when installed in a Rack 9306900/910 or NetBAY22 P/N 9306200 respectively for proper rear door closure clearance.
3. To provide adequate cooling, a blank filler panel should be placed on the front of any unused rack space. If non-IBM racks are to be used, assure that both front and rear doors offer approximately 60% open area uniformly distributed and in line with installed servers. A clearance of 51 to 64-mm (2 to 2-1/2 inches) must be maintained between the front door and the system unit's front bezel. The rear door must maintain the same or greater distance. Clearance between the EIA mounting rails and rack side covers must be less than 13-mm (1/2-inch) to prevent air re-circulation from back to front. Non-rack installations are not supported.
4. To provide adequate cooling, Blank Filler Panel Kit (P/N 94G6670) should be placed on the front of any unused rack space. If non-IBM racks are to be used, assure that both front and rear doors offer a minimum of 48% open area uniformly distributed and in line with installed servers. A clearance of 51 to 64-mm (2 to 2-1/2 inches) must be maintained between the front door and the system unit's front bezel. The rear door must maintain the same or greater clearance. Clearance between the EIA mounting rails and the rack side covers must be less than 13-mm (1/2 inch) to prevent air re-circulation from back to front. Non-rack or NetBAY3E installations are not supported.

Keyboard/Pointer/Monitor & Switch ... all in 3U



Console Switch
- Mounts to rear flanges
- Shares 3U space with display, keyboard and tray

Keyboard Tray Components
- P/N 28L4707 Rack Keyboard Tray
- P/N 37L6888 Flat Panel Monitor Rack Mount Kit II
- P/N 28L36xx Space Saver Keyboard
- P/N 11AG1xx T54A Flat Panel Color Monitor

Optional Accessories

Part Number	Mounting Support	Rack Space	Units Supported
94G7442	Fixed Shelf: width x depth= (439 mm x 663mm) 17.3 in. x 26.1 in max. weight= (45 kg)100lbs.	2 to xx U	IBM Networking Products 8222-008, 016 Nways Enet Wkgp Hub 2U 8225-003 Ethernet Hub 2U
36L9702	Netfinity NetBAY22 Rack Extension Kit installs on the rear of a 9306200[1].	-	Netfinity NetBAY22 9306200
36L9703	Netfinity Rack Extension Kit installs on the rear of a Rack P/N 9306900 or 9306910[1].	-	Netfinity Rack 9306900, 9306910
06P6010	Netfinity Rack Front Door Kit	-	Netfinity Rack 9306900

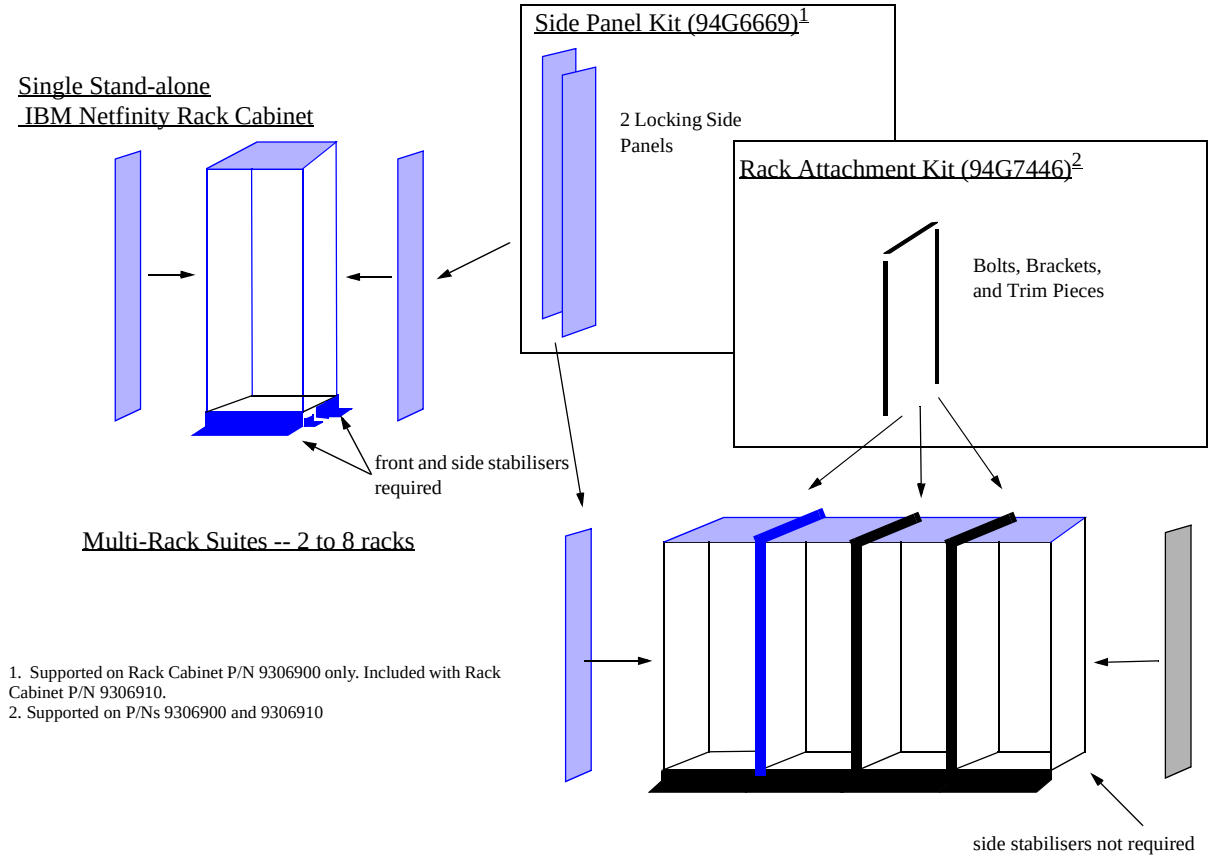
Part Number	Description	Console Support	Devices Supported		
			Devices	Height	Part Number
94G7444	Monitor compartment	One monitor and one console	**Monitors**		
			E51 Color Monitor	9U	T3347xx
			E54 Color Monitor	9U	31H2Nxx
			E74 Color Monitor	10U	T32N3xx
			G78 Color Monitor	10U	T274Axx
			T54A TFT LCD Color Monitor	3U	11AG1xx
28L4707	Netfinity Rack Keyboard Tray	One flat panel display and one space saver keyboard, and one keyboard mouse	**Keyboards/Mouses[2]**		
			Space Saver Keyboard[3, 4]	1U	28L36xx
			TrackPoint IV 104-Key[3]	1U	01K1260
			Tower Model Keyboards[5]	1 to 2U	-
			Monitors		
			T54A flat panel monitor[6]	-	11AG1xx
			Flat Panel Monitor Mount Kit II[7]	3U	37L6888
37L6888	Flat Panel Monitor Rack Mount Kit	Supports installation of a flat panel monitor into tray 28L4707	**Monitors**		
			T54A Flat Panel Monitor[6]	-	11AG1xx
94G7445	Console Server Selector Switch (8-port, Tier up to 64)	Mounts behind monitor compartment or in rack side When used with keyboard tray 28L4707 and flat panel kit 37L6857 it can also be installed behind the keyboard tray.	Console Cable Set - 12ft. (366 m)	-	94G7447
28L0542	Netfinity Console Server Selector Switch (4-port)				
94G7447	NetBay Console Cable Set- (3.66 m) 12 ft.	Attaches server to console switch	Console Server Selector Switch (8-port)	-	94G7445
			Netfinity Console Server Selector Switch (4-port)	-	28L0542

1.Expands current racks for better cable management or to accomodate systems requiring greater installation depth.
2. Check system sections for support of desired keyboards, mouse and monitors.
3. Advanced TrackPoint IV features are not supported by Netfinity servers or rack console switches.
4. Space saver keyboards may be stowed in a ready-to-use position within tray 28L4707.
5. Tower models of Netfinity servers includes keyboards, which are supported by both keyboard trays and console switches. These are not space saver keyboards.
6. Installation in a Netfinity Rack Keyboard Tray P/N 28L4707 requires Netfinity Flat Panel Monitor Rack Mount Kit P/N 37L6888. A space saver keyboard may coexist within keyboard tray P/N 28L4707.
7. When installed in Netfinity Rack Keyboard Tray P/N 28L4707 a flat panel monitor and space saver keyboard may coexist in the tray. Hardware is included for mounting a console selector switch to the rack directly to the rear of the tray thus sharing the same 3U space. See the Keyboard/Pointer/Monitor & Switch diagram above.

Part Number	Power Support	Rack Space	Comments
2PDUxxx[1]	200-240V 16a Power Distribution Unit	--	10 IEC 320-C13 outlets Mounts in rack side wall D,C
14RIxxx[1]	1400VA UPS 220-240V EMEA/ AP	3U	4 IEC 320-C13 outlets
30RIxxx[1]	3000VA UPS 220-240V EMEA/ AP	3U	8 IEC 320-C13 and 1 C19
94G7448	Power Cable Type Connectors C12 IEC 320-C13 to IEC 320-C14	-	Length (3.66 m) 12 ft.
Part Number	**Miscellaneous**	**Rack Space**	**Comments**
94G6670	Blank Filler Panel Kit 1U panel (qty. = 2) 3U panel (qty. =1) 5U panel (qty. = 1)	1U + 1U 3U 5U	Use as required to fill empty space in the vertical rack mount area.

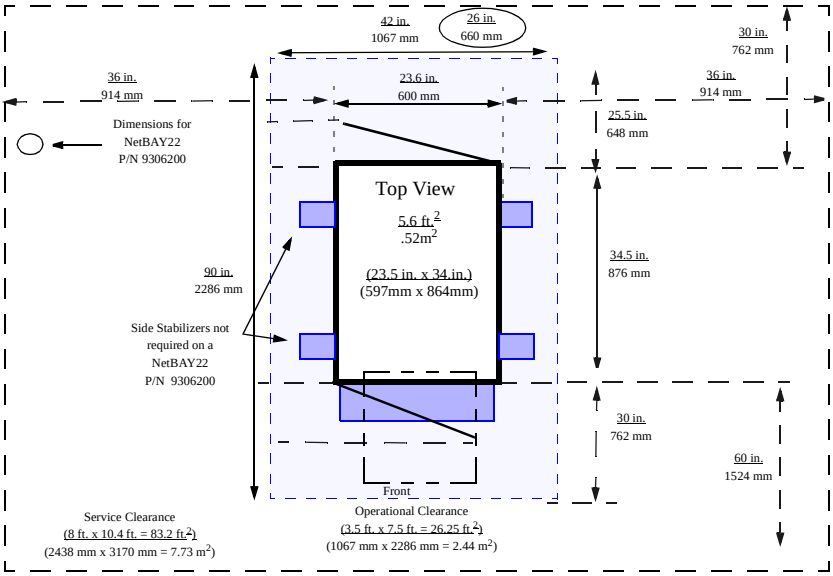
Note: You can select up to two power units per rack. Select the optional Power Cables when the standard cable is not long enough or has incompatible power plug.
1. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

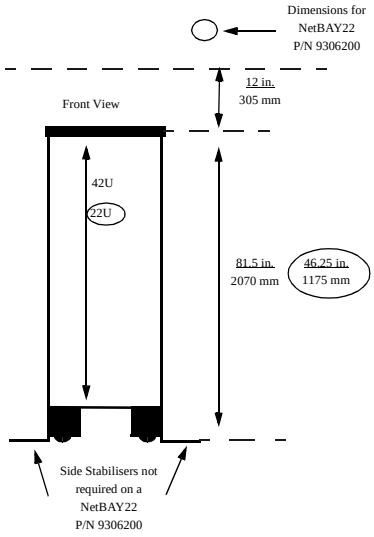
Single Cabinet or Multi-Rack Suite Options using Rack Cabinet P/N 9306900



1. Supported on Rack Cabinet P/N 9306900 only. Included with Rack Cabinet P/N 9306910.
2. Supported on P/Ns 9306900 and 9306910

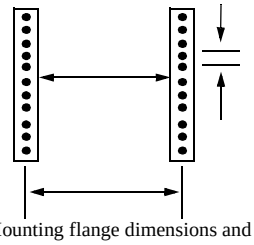
Netfinity Rack Cabinet P/Ns 9306900, 9306910 and NetBAY22 P/N 9306200 Dimensions





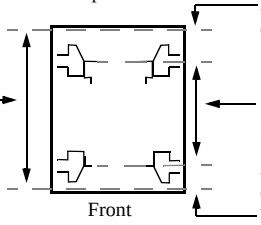
	Rack Cabinet P/Ns 9306900, 9306910		NetBAY22 P/N 9306200
Weight (lb/kg)	Moveable	Stationary	Moveable or Stationary
Empty rack	276/125	276/125	182/83
Max load	824/374	1424/646	746/338
Total	1100/499	1700/771	928/421

EIA 310-D standard 19-inch, type A cabinet
1U = (44.45 mm)1.75 inches



Mounting flange dimensions and universal hole spacing defined by EIA 310 for 19-inch racks

Internal Dimensions
Top View



31.8 in. (807.7 mm) (surface to surface)

to lock = 1.4 in. (35.6 mm)
to door = 2.3 in. (58.4 mm)

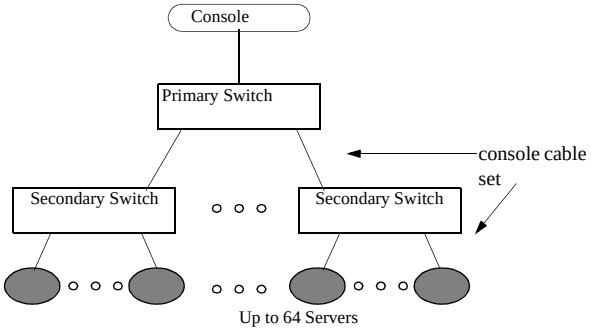
28.125 in. (714.4 mm) (inside flange to inside flange)

to frame = 2.2 in. (55.9 mm)
to glass = 3.0 in. (76.2 mm)

Front

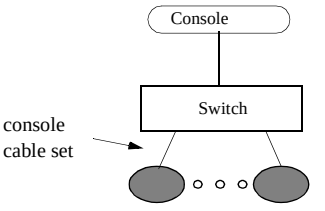
Switch Arrangements

Tiering



Up to 64 Servers
(depending on switch type)

Single Switch



Up to 4 or 8 Servers
(depending on switch type)

Appendix A: Tape Drive Attributes

Part Number	Withdrawn ddmmyy[13]	Description **Form Factor** LEGEND HH: Half High - approx. height of 1.6” SL: Slim Line - approx. height of 1” FH: Full High	SCSI Interface (bit)	Form Factor	Max GB-Native/Compr.[2]	MB/sec - Native/compr.[2]	Termination Incl.	68/50-pin Converter Incl.	Internal Cables	Data Cleaning Cridges Inc	Ext. Tape Enclosures[1]
01K1282	31/08/00	12/24GB DDS/3 4mm Internal Tape Drive	8	89 mm (3.5”) HH or 133 mm (5.25”)HH	12/24	1.1/2.2	Y[3]	Y	-	1/1	10L7440 03K8756
09N4041	-	12/24GB DDS/3 4mm Internal Tape Drive	8	89 mm (3.5”) HH or 133 mm (5.25”)HH	12/24	1.1/2.2	Y	Y	-	1/1	10L7440 03K8756
00N7991	-	20/40 GB DDS/4 4-mm Internal Tape Drive	16 Ultra2 LVD	89 mm (3.5”) HH or 133 mm (5.25”)HH	20/40	2.75/5.5	Y	N/A	-	1/1	10L7440, 03K8756[3]
01K1319	31/08/00	10/20GB NS Internal SCSI Tape Drive	8	89 mm (3.5”) SL or 133 mm (5.25”)HH	10/20	1/2	Y	Y	-	1/0	10L7440, 03K8756
09N4042	-	10/20GB NS Internal SCSI Tape Drive	8	89 mm (3.5”) SL or 133 mm (5.25”)HH	10/20	1/2	Y	Y	-	1/0	10L7440, 03K8756
01K1325	-	20/40GB 8mm Internal SCSI Tape Drive	16	133 mm (5.25”)HH	20/40	3/6	N	N/A	-	1/1	10L7440[4], 03K8756
01K1320	25/08/00	20/40GB DLT SCSI Tape Drive	8	133 mm (5.25”)FH	20/40	1.5/3	Y	Y	-	1/1	03K8705, 03K8756
09N4040	-	20/40GB DLT Internal SCSI Tape Drive	8	133 mm (5.25”)FH	20/40	1.5/3	N	Y	-	1/1	03K8705[4], 03K8756
00N7990	-	40/80 GB DLT Internal SCSI Tape Drive	16 Ultra2 LVD	133 mm (5.25”)FH	40/80	6/10	N	N/A	-	1/1	03K8705[4], 03K8756[3]
00N8017	-	60/120 GB 8mm M2 SCSI Tape Drive	16 Ultra2 LVD	133 mm (5.25”)HH	60/120	12/24	N	N/A	-	1[12]	10L7440[4], 03K8756[3]
00N8016	-	100/200 GB LTO Tape Drive	16 Ultra2 LVD	133 mm (5.25”)FH	100/200	15/30	N	N/A	-	1/1	03K8756[3]
Associated Options											
00N7956	-	68-pin External Multimode LVD/SE SCSI Terminator	16 LVD/SE	Ext.	-	-	Y	N	-	-	10L7440, 03K8705
94G7587	-	PC Server SCSI Terminator Kit	8/16	Int.	-	-	Y	N	-	-	-
36L9636	-	Netfinity Two-Drop Internal SCSI Cable[6]	16	Int.	-	-	Y	N	16-bit, 2-drop	-	-
10K2340	-	Media Bay Tray and LVD Cable Kit[7]	16 LVD	Int.	-	-	Y	N	16-bit 2-drop	-	03K8756
Tape Autoloaders											
00N79xx[14]	-	DLT Tape Autoloader	16	Desktop	280/560	5/10	Y	-	-	1/1	-
00N7992	-	120/240 GB DDS/4 Tape Autoloader	16 Ultra2 LVD	133 mm (5.25”)FH	120/240	3/6	N	N	-	5/1	03K8756

Form Factor

LEGEND
HH: Half High - approx. height of 1.6”
SL: Slim Line - approx. height of 1”
FH: Full High

Part Number	Withdrawn dd/mm/yy[13]	Description	SCSI Interface (bit)	Form Factor	Max GB-Native/Compr.[2]	MB/sec - Native/compr.[2]	Termination Incl.	68/50-pin Converter Incl.	Internal Cables	Data Cleaning Ctridgs Inc	Ext. Tape Enclosures[1]
External Tape Enclosures											
10L7440	-	External Half High SCSI Storage Enclosure[8]	8/16	Desktop	-	-	N	N	8-bit or 16-bit	-	-
03K8756	-	NetMEDIA Storage Expansion Unit EL[9]	16	Rack	-	-	Y	N	16-bit, 4-drop	-	-
10L7113	-	NetMEDIA Systems Management Adapter[10]	16	-	-	-	N	N	N	-	03K8756
03K8705	-	DLT External SCSI Enclosure[11]	16	Desktop	-	-	N	N	16-bit	-	-

1. To determine cable requirements, note the tape drive’s SCSI interface, the appropriate SCSI controller from the system configurator section and the desired enclosure then refer to Appendix D: Cables-Storage Units-Controllers.
2. Data compression typically provides a 2X improvenent in capacity and transfer rate, bur since data compression is affected by many factors, actual improvements may be more or less than 2X.
3. LVD support for LVD devices installed in a NetMEDIA Storage Expansion Unit EL P/N 03K8756 requires replacement of the standard single-ended internal cables with one or more (depending on configuration) cables from Media Bay Tray and LVD Cable Kit P/N 10K2340 which contains a single two-drop multi-mode terminated cable. If the standard cables are used for attachment to LVD devices, single-ended SCSI rules and bus speeds apply.
4. Requires 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
5. Requires installation of the multi-mode terminated LVD cable from Media Bay Tray and LVD Cable Kit P/N 10K2340.
6. Netfinity Two-Drop Internal SCSI Cable P/N 36L9636 is a single-ended wide two-drop terminated cable.
7. Media Bay Tray and LVD Cable Kit P/N 10K2340 includes an internal two-drop multi-mode terminated LVD SCSI cable.
8. Provides a black desktop 5.25” half-high (HH) tape enclosure. Connector is configurable as 50-pin Centronix or 68-pin high density. Requires either tape drive self termination or SCSI-2 16-bit Active Termination P/N 32G3918.
9. NetMEDIA Storage Expansion Unit EL P/N 03K8756 is a black 3U, 19” rack or NetBAY3/3E mountable tape enclosure which includes two full high (FH) or four half-high (HH) extended length 5.25” bays, two external 68-pin high density connectors and two internal four-drop single-ended terminated 16-bit SCSI cables for device attachment. Two power supplies and two standard country power cords are also included.
10. NetMEDIA Systems Management Adapter P/N 10L7113 may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
11. Provides a black desktop DLT tape enclosure, with a 68-pin high density external connector. Requires termination by the tape drive or by installation of 68-pin External Multimode LVD/SE SCSI Terminator P/N 00N7956.
12. A combination data/cleaning cartridge cleans the drive each time the data cartridge is used.
13. Not available from IBM after this date. Business Partner inventory may be available.
14. Where ‘xx’ represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.

Note: Tape support varies by system depending on internal bay availability, SCSI cabling type, number of cable drops, existence of a RAID controller and availability of a suitable external enclosure. The following general rules should be followed.
a) Tapes are not supported for attachment to RAID controllers.
b) Single-ended (non-LVD) devices may be attached to internal multi-mode terminated cables. The entire SCSI bus will be limited to single-ended operation with a maximum bus speed of Ultra-SCSI.
c) LVD devices attached to single-ended terminated cables will operate in single-ended mode with a maximum bus speed of Ultra-SCSI.

Internal SCSI Cables and Optional SCSI Adapters
Most systems support the following SCSI adapters for use with tape. Consult the I/O Options table in the system sections for specific system support. Where tapes are supported internal to the system, the cables which ship with the adapters are supported for tape attachment. Some restrictions may apply based on cable and tape type which are explaned in the note above.

Part Number	Description	Cable Description
02K3454	PCI Fast/Wide Ultra SCSI Adapter	Four-drop, single-ended terminated, 16-bit
19K4646	PCI Wide Ultra160 SCSI Adapter	Five-drop, multi-mode terminated
36L9636	Netfinity Two-Drop Internal SCSI Cable	Two-drop, single-ended terminated, 16-bit
10K2340	Media Bay Tray and LVD Cable Kit	Two-drop, multi-mode terminated

Appendix B: Tape Library Attributes

SCSI INTERFACE

LEGEND
F: Female - External
M: Male - External
68: 16-bit, 68-pin High Density connector
0.8: 16-bit, 68-pin Very High Density Connection Interface (VHDCI) 0.8 mm connector
Diff: Differential SCSI

Part Number	Description	SCSI Interface	Form Factor	Terminator Included	External Cables Incl (M)	SCSI Controllers Incl	Data Cartridges std/max	Cleaning Cartridges std.	Cartridge Mags std./ Qty. of drives - std./		Max GB-Native/Comp	MB/sec[1] - Native/compr.
00N79xx[4]	DLT Tape Autoloader	M68	Desktop	Y	M0.8mm - F68 Converter	Y	1/7	1	1/1	1/1	280/560	5/10
00N79xx[5]	DLT Tape Library - Tower	M68	Desktop	Y	M68-M68 (3)	Y	1/14	1	2/2	1/3	490/980	5/10
00N79xx[5]	DLT Tape Library - Rack[2]	M68	4U Rack	Y	M68-M68 (3)	Y	1/14	1	2/2	1/3	490/980	5/10
33L4979	DLT Library Drive Upgrade[3]	M68	-	N	Jumper	N	-	-	-	-	-	5/10

1. Transfer rates are for single SCSI Channel configurations. Tape Libraries utilizing split library or dual host configurations may obtain higher rates. Data compression typically provides a 2X improvement in capacity and transfer rate, bur since data compression is affected by many factors , actual improvements may be more or less than 2X.
2. Includes Fixed Shelf P/N 94G7442 for installation in an IBM Rack or NetBAY22.
3. Upgrade 33L4979 is an additional drive for DLT Tape Libraries. Up to two tape drives may be installed for a maximum of three drives per DLT Tape Library
4. Where 'xx' represents a country specific power cord code: 70=UK, 71=Swiss, 72=Italy, 73=Israel, 33L4981=EU1, 33L4982=Denmark, 33L4983=South Africa/India.
5. Where 'xx' represents a country specific power cord code: *Tower versions* - 74=EU1, 75=Denmark, 76=India/South Africa, 77=UK, 78=Swiss, 79=Italy, 80=Israel: *Rack versions* - 81=EU1, 82=Denmark, 83=India/South Africa, 84=UK, 85=Swiss, 86=Italy, 87=Israel.

Appendix C: UPS Runtime Estimate (minutes)

Servers	# Pwr. Cords Std/Max	Watts Load Max./Typ.[1]
Netfinity 1000[2]	1/1	225/160
Netfinity 3000[2]	1/1	225/160
Netfinity 3500 M20[2]	1/1	430/300
Netfinity 4000R	1/1	150/105
xSeries 200[2]	1/1	350/245
xSeries 220[2]	1/1	350/245
xSeries 230 / Netfinity 5100[2]	1/3	375/250
xSeries 240 / Netfinity 5600[2]	2/3	450/315
xSeries 330[2]	1/1	220/160
xSeries 340 / Netfinity 4500R[2]	1/2	390/270
Netfinity 6000R[2]	1/4	525/395
Netfinity 7100[2]	2/4	475/330
Netfinity 7600[2]	3/4	475/330
Netfinity 8500R[2]	3/3	1450/1015
Other Devices		
Fibre Channel RAID Controller Unit (P/N SFCU1xx)[2]	2/2	160/105
FAStT500 Storage Server (P/N 00N69xx)[2]	2/2	200/140
FAStT EXP500 Storage Expansion Unit (P/N 00N71xx)[2]	2/2	350/245
FAStT200 Storage Server (P/N 19K11xx)[2]	2/2	390/275
FAStT200 HA Storage Server (P/N 19K11xx)[2]	2/2	390/275
EXP200 Storage Expansion Unit[2]	1/2	350/280
EXP300 Storage Expansion Unit[2]	2/2	360/285
SAN Fibre Channel Switch 8-port (P/N 2109S08)	1/2	200/140
SAN Fibre Channel Switch 16-port (P/N 2109S16)	1/2	200/140
SAN Data Gateway Router (P/N 2108R3S)	1/1	90/60
DLT Tape Autoloader and Library (P/N 00N79xx)	1/1	135/100
NetMEDIA Storage Expansion Unit EL (P/N 03K8756)	2/2	185/130

1. This table represents general guidelines for selecting the appropriate UPS based on minimum and typical runtime estimates. A 'maximum configuration' load will result in 'minimum' UPS runtime. 'Typical' loads are based on a production system running at approximately 70% of maximum capacity. The 'typical' loads represent a more likely configuration and, therefore, a more likely estimate of runtime. Customer environments are unique and are unlikely to be precisely represented by any of the specific entries in the table.
2. Power-Factor Corrected (PFC) power supply.

	Tower					Rack Mounted		
	EMEA P/N	SU-700iNET P/N SUP072Y	SU-1000iNET P/N SUP102Y	SU-1400iNET P/N SUP142Y	SU-2200iNET P/N 06P60xx[6]	SU-1400RMiB P/N 14RIxxx[7]	SU-3000RMiB P/N 30RIxxx[7]	SU-5000RMiB P/N 37L6862
	US P/N	SU-700NET 94G3134	SU-1000NET 94G3135	SU-1400NET 94G3136	Not Available	SU-1400RMB 94G6674	SU-3000RMB 94G6676	SU-5000RMB 37L6861
UPS Attributes[1]								
Communications Links to Servers		1	1	1	1	1	3	3
Color		black	black	black	beige	black	black	black
EIA Height		-	-	-	-	3U	3U	5U
EMEA Models								
50 or 60 Hz, single phase, VAC:		220-240 (208)[2]	220-240 (208)[2]	220-240 (208)[2]	220-240 (208)[2]	220-240 (208)[2]	220-240 (208)[2]	220-240 (xxx)[2,3]
10 Amp, IEC 320-C13 (Device) receptacles		4	4	4	8	4	8	8
16 Amp, IEC 320-C19 (PDU P/N 2PDUxxx) receptacles		-	-	-	1	-	1	2
Line Cord Receptacle (IEC 320-)		C14	C14	C20	C20	C14	C20	TB[5]
US Models								
50 or 60 Hz, single phase, VAC:		120 (120)[2]	120 (120)[2]	120 (120)[2]	-	120 (120)[2]	120 (120)[2]	200-220 (208)[2]
Receptacles (NEMA 5-15R)		4	6	6	-	6	8	-
10 Amp, IEC 320-C13 (Device) receptacles		-	-	-	-	-	-	8
16 Amp, IEC 320-C19 (PDU 94G7450) receptacles		-	-	-	-	-	-	2[4]
Line Cord Length, NEMA Plug		6 ft., 5-15P	6 ft., 5-15P	6 ft., 5-15P	-	6 ft., L5-15P	6 ft., L5-30P	8 ft., L5-30P

1. Data provided by APC.
2. How-to-Read example for 220-240(208): Input VAC is 220- 240 as is the UPS output when electric service is active. When electriic service is interupted and the UPS is on battery the UPS output is 208 VAC.
3. Battery output may be set to 220, 225, 230, or 240 VAC.
4. Two PDU jumper cables ship with the UPS for attachment from the IEC 320-C19 receptacles to Power Distribution Units (PDU) (P/N 2PDUxxx).
5. SU-5000RMiB (P/N 37L6862) contains a Terminal Block (TB) for direct attachment to an electrical source by qualified personnel.
6.Where 'xx' represents the appropriate country code as follows:- 14=UK, 15=Denmark/Switzerland, 16=EUR, 17=Israel, 18=Italy, 19=South Africa.
7. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

	Total Configuration Runtime Estimator (Time in minutes)[1]						
	Tower				**Rack Mount**		
EMEA Part Number	SU-700iNET P/N SUP072Y	SU-1000iNET P/N SUP102Y	SU-1400iNET P/N SUP144Y	SU-2200iNET P/N 06P60xx[5]	SU-1400RMiB P/N 14RIxxx[6]	SU-3000RMiB P/N 30RIxxx[6]	SU-5000RMiB P/N 37L6862
US Part Number	SU-700NET 94G3134	SU-1000NET 94G3135	SU-1400NET 94G3136	Not Available	SU-1400RMB 94G6674	SU-3000RMB 94G6676	SU-5000RMB 37L6861
Total Load (Watts)	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes
200	22	38	62	130	45	104	240
250	17	28	43	104	34	84	200
300	12	22	34	85	25	70	166
350	9	18	29	71	22	58	145
400	7	14	23	65	18	52	125
450	5	12	20	52	15	45	110
500	-	11	18	43	13	38	97
550	-	9	16	38	11	35	87
600	-	8	13	34	10	31	76
650	-	7	12	31	9	29	68
700	-	6	11	28	8	26	63
750	-	-	10	25	8	24	59
800	-	-	9	23	7	22	55
850	-	-	8	21	7	20	51
900	-	-	7	19	6	18	47
950	-	-	6	18	5	17	43
1000	-	-	-	17	-	16	39
1100	-	-	-	15	-	14	34
1200	-	-	-	13	-	12	31
1300	-	-	-	11	-	10	28
1400	-	-	-	9	-	9	25
1500	-	-	-	9	-	8	22
1600	-	-	-	8	-	8	20
1700	-	-	-	-	-	7	18
1800	-	-	-	-	-	-	17
1900	-	-	-	-	-	-	14
2000	-	-	-	-	-	-	12
2100	-	-	-	-	-	-	11
2200	-	-	-	-	-		11
2300	-	-	-	-	-	-	10
2400	-	-	-	-	-		10
2500	-	-	-	-	-	-	9
2600	-	-	-	-	-		9
2700	-	-	-	-	-	-	8
2800	-	-	-	-	-	-	8

1. Data provided by APC.

Steps:
1. Identify the devices contained in the configuration.
2. Sum the load (watts) of all devices in the configuration. Use either Maximum Load for minimum runtime, or Typical Load for typical runtime.
3. Find the Total Configuration Load in the table above.
4. Select the most appropriate UPS model to achieve the desired runtime.
5. Where 'xx' represents the appropriate country code as follows:- 14=UK, 15=Denmark/Switzerland, 16=EUR, 17=Israel, 18=Italy, 19=South Africa.
6. Where 'xxx' represents the appropriate country code as follows:- DEN=Denmark, ISR=Israel, ITA=Italy, SDI=Saudi Arabia, SAF=South Africa, SWS=Switzerland, UKM=United Kingdom, EUR=Europe.

NOTE: If the Total Configuration Load is greater than the entries above, split the load across two or more UPS units.

Appendix D: Cables - Storage Units - Controllers

F: Female - External
M: Male - External
I: Internal
68: 16-bit, 68-pin High Density connector
50: 8-bit, 50-pin Centronix Connector
0.8: 16-bit, 68-pin Very HighDensity Connection Interface (VHDCI) 0.8 mm connector
16: 16-bit, 68-pin connector
8: 8-bit, 50-pin connector

Instructions: Identify Desired Controller Row and Storage Unit Column. The intersection of row and column contains the cable group letter which supports the connection. Go to the cable group under the corresponding storage unit for specific support. Read all Notes for row, column, and any cable group footnotes.

						EXP15 SE2RXxx	EXP200 00N6xxx[19]	EXP300 19K11xx	External HH SCSI 10L7440	DLT Ext. SCSI 03K8705	NetMEDIA 03K8756	NetMEDIA Adapter 10L7113
					Storage Enclosure Unit							
					Max.MB/sec.)[1]	40	80	160	-	-	-	-
					LVDS	X	X	X	-	-	X	-
					Connector Type	F0.8	F0.8	F0.8	F68 or F50	F68	F0.8	F0.8
Description	**Part Number**	**Max./ Channel (MB/sec)[1]**	**LVDS**	**Connector Type/ Max**	**Note #**	2, 3	2, 4	2, 5	6	6, 7	2, 6	2, 6, 8
RAID Storage Controllers												
Netfinity Fibre Channel RAID Controller Unit	SFCU1xx	80	X	F0.8/6	9	A	A	-	-	-	-	-
Netfinity ServeRAID-4L Ultra160 SCSI Controller	37L6091	160	X	F0.8/1	13	A	A	A	-	-	-	-
Netfinity ServeRAID-4M Ultra160 SCSI Controller	37L6080	160	X	F0.8/2	13	A	A	A	-	-	-	-
Netfinity ServeRAID-4H Ultra160 SCSI Controller	37L6889	160	X	F0.8/4	13	A	A	A	-	-	-	-
Netfinity ServeRAID-3HB Ultra2 SCSI Adapter	37L6086	80	X	F0.8/3	-	A	A	A	-	-	-	-
Netfinity ServeRAID-3L Ultra2 SCSI Adapter	01K7364	80	X	F0.8/1	-	A	A	A	-	-	-	-
Netfinity ServeRAID-3L Ultra2 SCSI Adapter II	19K0564	80	X	F0.8/1	-	A	A	A	-	-	-	-
Ultra160 SCSI Controllers												
PCI Wide Ultra160 SCSI Adapter	19K4646	160	X	F0.8/1	-	-	-	-	-	B	B	A
Netfinity 6000R - Ultra160 SCSI	Onboard	160	X	F0.8/1	-	-	-	-	-	-	B	A
Ultra2 SCSI Controllers												
Netfinity 3000 - Model P/Ns 780UExx and up	Adapter	80	X	F68/1	-	-	-	-	C	C	-	-
xSeries 240 / Netfinity 5600	Onboard	80	X	F0.8/1	-	-	-	-	B	B	B	A
Netfinity 7100	Onboard	80	X	F0.8/1	-	-	-	-	B	B	B	A
Netfinity 7600	Onboard	80	X	F0.8/1	14	-	-	-	B	B	B	A
Netfinity 8500R	Onboard	80	X	F0.8/1	-	-	-	-	B	B	B	A
Ultra SCSI Controllers												
PCI Fast/Wide Ultra SCSI Adapter	02K3454	40	-	F68/1	-	B[11]	B[11]	-	C	C	C[23]	B
Netfinity 3000 - Model P/Ns 771UExx and before	Adapter	40	-	F68/1	-	-	-	-	C	C	-	-
Netfinity 4000R - non-RAID models	Adapter	40	-	F68/1	-	-	-	-	-	-	B	-
No Onboard External Port[22]												
Netfinity 1000 Value Model (IDE)	N/A	-	-	N/A	15	-	-	-	-	-	-	-
Netfinity 3500 M20	Onboard	-	-	N/A	-	-	-	-	-	-	-	-
Netfinity 4000R - RAID models	Adapter	80	X	F0.8/1	21	-	-	-	-	-	-	-
xSeries 200	Onboard	-	-	N/A	-	-	-	-	-	-	-	-
xSeries 220	Onboard	-	-	N/A	-	-	-	-	-	-	-	-
xSeries 330	Onboard	-	-	N/A	-	-	-	-	-	-	-	-
xSeries 340 / Netfinity 4500R	Onboard	-	-	N/A	-	-	-	-	-	-	-	-
xSeries 230 / Netfinity 5100	Onboard	-	-	N/A	-	-	-	-	-	-	-	-
Related Options												
0.8mm to 68-pin SCSI Adapter	01K8017	-	-	M0.8-F68	16	-	-	-	-	-	-	-
Cable Group A (M0.8-M0.8)												
Netfinity 2M Ultra2 SCSI Cable	03K9310	-	X	M0.8-M0.8	15	X	X[18]	X[18]	-	-	X	X
Netfinity 4.2M Ultra2 SCSI Cable	03K9311	-	X	M0.8-M0.8	15	X	X	X	-	-	X	X
Netfinity 20 M Ultra2 SCSI Cable	37L7101	-	X	M0.8-M0.8	10	X[10]	X[10]	X	-	-	-	-
Cable Group B (M68-M0.8)												
IBM 2M External .8mm SCSI Cable	01K8027	-	-	M68-M0.8	-	X	X	X	X	X	X	X
Cable Group C (M68-M68)												
PC Server F/W to F/W External SCSI Cable-1m	SS2C02Y	-	-	M68-M68	23	-	-	-	X	X	X[23]	-

F: Female - External
M: Male - External
I: Internal
68: 16-bit, 68-pin High Density connector
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0.8: 16-bit, 68-pin Very HighDensity Connection Interface (VHDCI) 0.8 mm connector
16: 16-bit, 68-pin connector
8: 8-bit, 50-pin connector

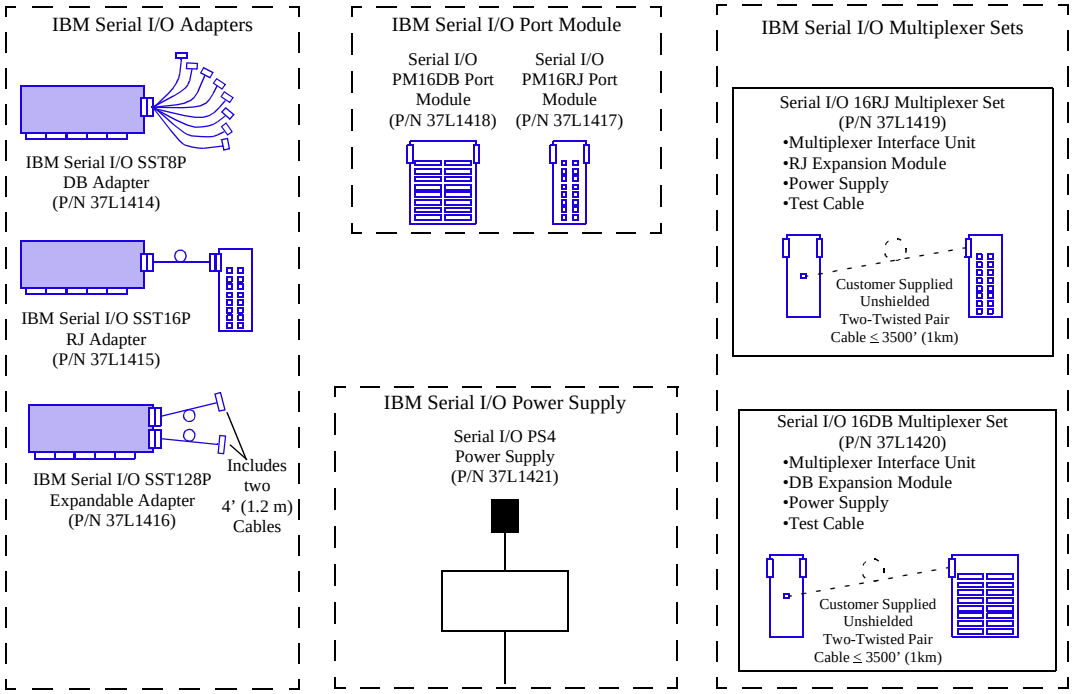
Instructions: Identify Desired Controller Row and Storage Unit Column. The intersection of row and column contains the cable group letter which supports the connection. Go to the cable group under the corresponding storage unit for specific support. Read all Notes for row, column, and any cable group footnotes.

						Storage Enclosure Unit	**EXP15 SE2RXxx**	**EXP200 00N6xxx[19]**	**EXP300 19K11xx**	**External HH SCSI 10L7440**	**DLT Ext. SCSI 03K8705**	**NetMEDIA 03K8756**	**NetMEDIA Adapter 10L7113**
						Max.MB/sec.)[1]	40	80	160	-	-	-	-
						LVDS	X	X	X	-	-	X	-
						Connector Type	F0.8	F0.8	F0.8	F68 or F50	F68	F0.8	F0.8
Description	**Part Number**	**Max./ Channel (MB/sec)[1]**	**LVDS**	**Connector Type/ Max**	**Note #**		2, 3	2, 4	2, 5	6	6, 7	2, 6	2, 6, 8
Cable Group D (Short Wave Fibre)[19]													
Netfinity Fibre Channel 1 M Cable	36L9973	-	N/A	S/W Fibre	-		-	-	-	-	-	-	-
Netfinity Fibre Channel 5 M Cable	03K9306	-	N/A	S/W Fibre	-		-	-	-	-	-	-	-
Netfinity Fibre Channel 25 M Cable	03K9305	-	N/A	S/W Fibre	-		-	-	-	-	-	-	-
Customer supplied cables ≤500M (0.31 miles)	**********	-	N/A	S/W Fibre	-		-	-	-	-	-	-	-
Cable Group E (Long Wave Fibre)[19]													
Customer supplied cables ≤ 10 KM (6.2 miles)	**********	-	N/A	L/W Fibre	-		-	-	-	-	-	-	-
Cable Group G (Other)													
68-pin External Multimode LVD/SE SCSI Terminator	00N7956	-	-	M68	-		-	-	-	X	X	-	-
GBIC[19]													
Netfinity Fibre Channel Short-Wave GBIC	03K9308	-	N/A	S/W Fibre	20		-	-	-	-	-	-	-
Netfinity Fibre Channel Long-Wave GBIC	03K9307	-	N/A	L/W Fibre	-		-	-	-	-	-	-	-

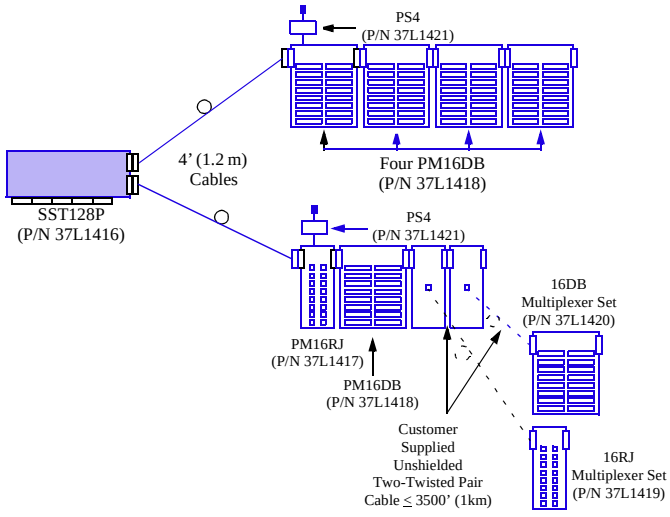
1. Maximum supported speeds may be limited by installation of lower speed devices, controllers or cable lengths greater than 2 meters.
2. Rack installation cable management requires devices to have a minimum cable length of 2 meters. Cable length requirements will vary based on placement within a single or multiple rack suite.
3. Attachment to wide ultra SCSI controllers limits operational speeds to Ultra SCSI (40 MB/s) for cables up to 2 meters in length and Fast/Wide SCSI (20 MB/s) for cable lengths between 2 meters and 4.3 meters. Ultra2 SCSI controllers and cables allow cable lengths of up to twenty meters at up to 40 MB/s.
4. Attachment to wide ultra SCSI controllers limits operational speeds to Ultra SCSI (40 MBps) for cables up to two meters in length and Fast Wide (20 MBps) for cable lengths between 2 meters and 4.3 meters. Ultra2 SCSI controllers and cables allow cable lengths up to 20 meters at up to 80 MBps.
5. Maximum speeds may be limited by the installed devices or SCSI controller.
6. Daisy chaining tape enclosures is not supported at this time.
7. Requires 68-pin External Multimode LVD/SE SCSI Terminator (P/N 00N7956).
8. NetMEDIA Systems Management Adapter (P/N 10L7113) may be installed in a NetMEDIA Storage Expansion Unit to provide repeater function, LVDS interface, aggregate cable lengths up to 12 meters when attached to an LVD SCSI controller, and auto-termination when the Expansion Unit is powered off. External connector is 0.8-mm VHDCI.
9. Connection to either IBM SAN Fibre Channel Managed Hub (P/N 35L1647) or Netfinity Fibre Channel PCI Adapter (P/N 01K7297) requires short wave fibre cables from Cable Group D.
10. Cable lengths exceeding 4.3 meters are NOT supported for attachment to non-Ultra-2 controllers.
11. Installations with cable lengths greater than 2 meters are limited to SCSI Fast/Wide speeds of 20MB/S .
12. RAID support for tape drives is limited to Non-RAID functions and utilisation of a dedicated channel.
13. Maximum speeds may be limited by the enclosure or installed devices.
14. Netfinity 7600 also includes a Netfinity ServeRAID-3HB Ultra2 SCSI Adapter (P/N 37L6086). See ServeRAID-3HB for connectivity requirements.
15. Does not support external attachment of SCSI devices attached to optional controllers.
16. Converts a F0.8mm into a F68-pin connector for attachment of an external M68 cable .
17. Supports attachment to Ultra-2 or single-ended SCSI controllers with operational speeds of up to Ultra-2. Controller, storage unit, cable length or storage device limitations may apply (see Max. MB/sec row and column above).
18. Netfinity EXP200 (P/N 00N6xxx) and EXP300 (P/N 19K11xx) include a single 2 metre Ultra2 SCSI cable similar to Netfinity 2 M Ultra2 SCSI Cable (P/N 03K9310).
19. See Fibre Array Solutions section for device attachment.
20. Short wave GBICs are included with various devices. See Fibre Array Solutions section for specific details.
21. The RAID adapter has both an internal and external port. Only one of the two ports may be used. The internal HDDs are attached to the RAID adapter therefore the external port must not be used.
22. No external SCSI port is available on these systems. A supported optional controller must be installed. See the systems section to determine which controllers and external storage units are supported then refer back to this table for cable requirements using the controller row. The Netfinity 4000R does not support customer installation of adapters that must be installed inside the server. Non-standard features must be installed at the factory. Contact your IBM Marketing Representative for more information.
23. Not supported for use in a rack. Rack installations require a minimum cable length of two meters.

To access IBM information specific to your country via the World Wide Web, use address: http://www.pc.ibm.com

Appendix E: IBM Serial I/O



Sample Configurations



37L1414	Serial I/O SST8P DB Adapter[1, 5]
37L1415	Serial I/O SST16P RJ Adapter[2, 5]
37L1416	Serial I/O SST128P Expandable Adapter[3, 5]
37L1417	Serial I/O PM16RJ Port Module[4]
37L1418	Serial I/O PM16DB Port Module[4]
37L1419	Serial I/O 16RJ Multiplexer Set[4, 6]
37L1420	Serial I/O 16DB Multiplexer Set[4, 6]
37L1421	Serial I/O PS4 Power Supply[4]

1. Intelligent serial I/O interface card providing eight DB-25 RS232 serial connections using an octopus cable. Support for all ports at 921.6 Kbps simultaneously.
2. Intelligent serial I/O interface card providing sixteen RJ-45 RS232 serial connections in a breakout box. Support for all ports at 115.2 Kbps simultaneously.
3. Intelligent interface card providing up to 128 RS232 serial connections (DB25 or RJ45) configured in 16 port increments utilizing any combination of Port Modules and Multiplexer Sets. Includes two 4' (1.2 m) bus cables. Each 4' cable supports attachment of 1 to 4 Port Modules and/or Multiplexer Interface Units for a total of 8 per adapter. The first Port Module or Multiplexer Set attached to a cable requires a Serial I/O PS4 Power Supply (P/N 37L1421). Support for all ports at 115.2 Kbps simultaneously.
4. Port Modules and Multiplexer Sets attach directly to one the two standard 4' (1.2m) bus cables of the Serial I/O SST128P Expandable Adapter (P/N 37L1416) or directly to 1 or more Port Modules or Multiplexer Sets already attached to one of the cables. A maximum of 4 Port Modules or Multiplexer Sets may be attached to single cable. The first Port Module or Multiplexer Set attached to a cable requires a Serial I/O PS4 Power Supply (P/N 37L1421).
5. Serial I/O Adapters are 32-bit PCI half length cards. A maximum of four Serial I/O adapters (in any combination) may be installed in a single host system.
6. Requires a customer supplied Unshielded Two-Twisted Pair (Catagory 3 minimum) cable with a maximum length of 3,500 feet (1 Km).

Appendix F: IBM ServicePacs for Hardware Maintenance

IBM Netfinity 24 hour by 7 days cover - 4 hour response target	
Model Type	**Part No**
xSeries 130 / 135	14J1468
xSeries 150	14J1470
xSeries 200	14J1466
xSeries 220	14J1466
xSeries 330	14J1468
Netfinity 1000	14J1225
Netfinity 3000	72H9988
Netfinity 3500 M10	72H9988
Netfinity 3500 M20	14J1466
xSeries 340 / Netfinity 4500R	14J1468
Netfinity 5000	72H9989
xSeries 230 / Netfinity 5100	14J1470
Netfinity 5500	72H9989
Netfinity 5500 M10	72H9989
Netfinity 5500 M20	72H9989
xSeries 240 / Netfinity 5600	14J1316
Netfinity 6000R	14J1472
Netfinity 7000 M10	72H9991
Netfinity 7100	14J1330
Netfinity 7600	14J1318
Netfinity 8500R	14J1315

IBM Netfinity 9 hour by 5 days cover - 4 hour response target	
Model Type	**Part No**
xSeries 130 / 135	14J1467
xSeries 150	14J1469
xSeries 200	14J1465
xSeries 220	14J1465
xSeries 330	14J1467
Netfinity 1000	14J1224
Netfinity 3000	14J0528
Netfinity 3500 M10	14J0528
Netfinity 3500 M20	14J1465
xSeries 340 / Netfinity 4500R	14J1467
Netfinity 5000	14J0528
xSeries 230 / Netfinity 5100	14J1469
Netfinity 5500	14J0528
Netfinity 5500 M10	14J0528
Netfinity 5500 M20	14J0528
xSeries 240 / Netfinity 5600	14J1317
Netfinity 6000R	14J1471
Netfinity 7000 M10	14J0528
Netfinity 7100	14J1320
Netfinity 7600	14J1319
Netfinity 8500R	14J1329

Important Notes

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MHz only measures microprocessor internal clock speed, not application performance. Many factors affect application performance.
When referring to hard drive capacity, MB stands for million bytes and GB stands for one thousand million bytes.Total user-accessible capacity may vary depending on operating environments.
Tape Drives which utilise data compression technology have storage capacity that will vary depending upon whether the drive is operating in native mode (without compression) or compressed mode. Actual storage capacity will vary based upon many factors and may be less than the maximum possible.
Maximum internal hard disk drive capacities assume the replacement of any hard disk drives and the population of all hard disk drive bays with the largest currently supported drives available from IBM.
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